Sample No.	Location	Rock name	Microscopic observation	Remarks
242	Tintaya Mine	Quartz monzonite porhyry	Phenocrysts of plagioclase (subhedral, up to 2 mm, showing polysynthetic twinning and weak zoning), potash feldspar (subhedral to anhedral, up to 1 mm), quartz (anhedral rounded and corroded, up to 1 mm), biotite (rarely tabular flake and commonly fine-grained aggregate, with a pleochroism of X = yellow and Z=Y dark brown) and microphenocrystic hornblende (up to 0.4 mm, pale green) are in a fine-grained and xenomorphic granular groundmass of plagioclase, potash feldspar and quartz with minor amounts of opaque minerals, sphene and apatite. Epidote, sericite and chlorite occur as alteration products. Especially mafic silicates are markedly altered to secondary minerals.	
243	Tintaya Mine	Quartz monzonite porhyry	Phenocrysts of plagioclase (subhedral prismatic, up to 2 mm, with polysynthetic twinning and weak zoning), potash feldspar (subhedral to anhedral, up to 0.6 mm), a little quartz and brown biotite are in a fine-grained groundmass of plagioclase, potash feldspar and quartz with small amounts of apatite and opaque minerals. Quartz is subhedral to anhedral, and large crystals are partially corroded. Most plagioclase crystals are largely altered to sericite and clay minerals. Biotite is rarely fresh and mostly altered to chlorite and epidote.	
244	Tintaya Mine	Altered latite	The rock is highly altered and most of primary minerals are replaced by secondary minerals. It has a porphyritic texture and phenocrysts of plagioclase, potash feldspar and rare quartz are in a fine-grained groundmass of plagioclase lath, potash feldspar and quartz with a small amount of silica mineral. Glass is not recognized at present. A few crystals of apatite are present. Mafic phenocrysts are completely altered to chlorite and sericite, but they may be biotite principally. Feldspars are highly argillized and sericitized.	

Sample No.	Location	Rock name	Microscopic observation	Remarks
302	No.1. 63.6	Porphyritic granodiorite	The rock is weakly porphyritic and contains plagioclase, potassic feldspar and quartz (plagioclase > K-feldospar > quartz), with veins and veinlets filled in sulphides-- specular hematite-- quartz-- chlorite. Accessories are a little sercite in saussuritized feldspar and leucoxene after sphene.	
304	No.1. 68.0	Porphyritic granodiorite	The rock is weakly porphyritic and holocrystalline. It contains plagioclase (subhedral, up to 3 mm, always oligoclase with andesine core), quartz (anhedral, interstitial), potassic feldspar (subhedral, up to 2 mm, with a distinct pleochroism of X = pale yellowish green, Y = yellowish green, Z = pale green). (plagioclase > K-feldospar > quartz > hornblende); fairly rich in sphene associated with hornblende and/or magnetite. Weak altered minerals are cabonates, chlorite and sericite (cabonates > chlorite > sericite).	
306	No.1. 75.55	Porphyritic granodiorite	Porphyritic plagioclase (subhedral, up to 1.5 mm, zened and twinned after albite, Carlsbad and less abundant pericline laws) are filled by finer-grained and interstitial potash feldspar (up to 0.7 mm, anhedral), quartz (anhedral, up to 0.4 mm) and subordinate brown biotite with a little sphene and opaque minerals. Feldspars are sericitized especially in potash feldspar. Biotite is almost completely altered to chlorite-carbonate aggregates and much less abundantly to clinozoicite.	
308	No.1. 95.5	Porphyritic granodiorite	The rock shows a fine-grained and porphyritic texture. The main constituent minerals are plagioclase (porphyritic, up to 6 mm, zoned, An% varying from 50 in the core to 30 near the mantle with Carlsbad and albite twinning), potassic feldspar (subhedral, up to 1 mm, always perthitic orthoclase with very fine lamellae of albite), quartz (anhedral, very fine-grained, interstitial), hornblende (subhedral, up to 2 mm, with a pleochroism of X = yellowish green, Y = yellowish green Z = pale green), and biotite (subhedral, up to 2 mm, showing a pleochroism of brownish tinge). Accessory minerals are sphene, apatite and ore. Fine-grained biotites are secondarily formed due to the break down of original biotite and hornblende.	

Sample No.	Location	Rock name	Microscopic observation	Remarks
			Chlorite occur along the mergin of biotite. Quartz alkali-feldspars in groundmass. Secondary biotite after essential biotite and hornblende are present. Carbonates, chlorite and (sericite) are not so abundant.	
309	No.1.141.7	Cataclastic granodiorite	The rock is mainly composed of plagioclase, perthitic orthoclase and quartz, plagioclase > orthoclase >> quartz. It is intensely fractured and cut by the veinlets filled with carbonate, ore and chlorite. Plagioclase shows Carlsbad and albite twinning, being after twisted and destroyed due to the secondary deformation but having weak signs of the saussuritization, very rich in chlorite -specularite stockworls in commonly along with carbonates.	
310	No.1.147.8	Porphyritic granodiorite	The rock is fine- to medium-grained and weakly porphyritic. The main constituents are plagioclase (subhedral, up to 3 mm, with Carlsbad and albite twinning, always andesine, sometimes zoned), potassic feldspar (subhedral, up to 2 mm, often perthitic orthoclase), quartz (anhedral, fine-grained, sometimes showing wavy extinction). The secondary minerals are carbonate (fairly rich), chlorite, biotite (twisted, brownish-secondary chlorite being wavy extinction) and hornblende (subhedral, up to 2 mm, with pale greenish tint). The accessories are sphene, apatite and ore. Aggregates of fine-grained biotite shows the break down of hornblende.	
311	No.1.231.3	Cataclastic granodiorite	The rock contains quartz, plagioclase and small amounts of potassic feldspar with accessory ore and sphene. Plagioclase is always albite. Potassic feldspar is always perthitic orthoclase. Distinctly discernible are signs of secondary deformation such as fractured grains of quartz and feldspars, twisted plagioclase and elongated quartz. Chlorite is formed in masses of little crystals perhaps resultory from the replacement of an original biotite. Veins filled with carbonate cut the rock in all directions and very rich ditto in specularite-cabonates veins bearing.	
312	No.2 50.5	Quartzite	The rock, showing cataclastic texture, is composed mainly of quartz. The coarser grained quartz (up to 1 mm) occur 'cemented' by finer-grained quartz. All grains shown wavy extinction and elongated shape.	

Sample No.	Location	Rock name	Microscopic observation	Remarks
			suggesting the effect of the deformation. A grain of tourmaline (purple in tint) as present. Aggregates of secondary muscovite occur sporadically, forming an pseudomorph after feldspar. A little secondary biotite with brownish tinge is also present. A little hystorogene chlorite is characteristic. Sericite aggregates after feldspar are present.	
313	No.2. 60.5	Quartz monzonite porphyry	Phenocrysts of plagioclase, potassic feldspar and biotite occur in a fine-grained alkali-feldspar rich groundmass. Phenocrysts of plagioclase is zoned, with Carlsbad twinning, biotite have perfectly been altered to chlorite. As an accessory, there are sphene, apatite and ore, to which garnet must be added. Epidote, chlorite and sericite are common hystorogene minerals. Sulphides-quartz veinlets are found.	
314	No.2. 74.0	Hornfels of slate	The rock has weak foliation characterized by the parallel arrangement of flaky minerals. It consists of brownish biotite, quartz, plagioclase, colorless amphibole and muscovite. The accessory minerals are garnet, epidote and sphene. The rock must be suffered by the weak thermal alteration. Dissemination of sulphide is rich and latest carbonization are formed.	
315	No.2. 93.6	Hornfels of sandstone	The rock mainly composed of subangular quartz and plenty of feldspar in finer-grained matrix. Feldspars are perthitic orthoclase and plagioclase, both of which are detrital. Fine grains of biotite, which now have been altered to chlorite, is arranged parallel to the effect of weak alteration. Carbonate, sphene and apatite are accessory, and also a little sulphide are present.	
316	No.2.117.5	Quartz monzonite porphyry	The rock is composed of phenocryst of plagioclase (subhedral, up to 3 mm, zoned, with Carlsbad twinning), potassic feldspar, biotite (completely chloritized, subhedral, up to 2 mm, not so abundant) and a little hornblende. They occur in a fine-grained groundmass of alkali-feldspar and a little quartz. Weak sericitization and marked saussuritization of feldspars are observed. Sulphide-quartz-carbonate veins are formed, and also dissemination of sulphides.	

Sample No.	Location	Rock name	Microscopic observation	Remarks
317	No.2.152.10	Olivine basalt	Phenocrysts of olivine (subhedral, up to 4 mm, wholly altered to iddingsite and chlorite), and of augite (subhedral, up to 1 mm, sometimes showing hour glass structure) are in a medium-grained, almost holocrystalline and intergranular groundmass of lath-shaped plagioclase, olivine, augite and ore. Dressy cavities are filled with zeolites.	
318	No.2.158.9	Hornfels of sandston	It is composed of recrystallized quartz and biotite with relict feldspar. Aggregates of fine biotite, epidote and garnet are characteristic, reflecting the thermal effect. Optically negative chlorite with greenish tinge, replacting biotite, is the product of latest alteration process. Spene, apatite and ore are accessory.	
319	No.2.172.6	Foliated granodiorite	The rock shows porphyritic and foliated texture. Phenocrysts of plagioclase (subhedral, up to 2 mm, with Carlsbad and albite twinning, always oligoclase, zoned), potassic feldspar (perthitic orthoclase, up to 2 mm, not so aboundant) and hornblende (subhedral, columnar, up to 2 mm, with a pleochroism of X = yelloish green, Y = brownish green, Z = grass green) occur in a foliated groundmass of alkali-feldspar and a little quartz. Twisted twinning planes of feldspar and bending cleavage plane of hornblende, in addition to the foliated texture, may suggest the experienced history of deformation. Secondary products are chlorite, epidote and slight sericite. Accessory minerals are sphene, apatite and ore. Hornblende is partly altered to biotite.	
320	No.3 41.1	Gabbro	The texture is holocrystalline. Main association is plagioclase (subhedral, sometimes porphyritic, up to 4 mm, always with the composition of Ab20 An80 with more acid mantle), hornblende (subhedral, up to 2 mm, originally with greenish brown, partly altered to grass greenish amphibole) and a small amount of biotite (brownish, altered to chlorite from its margin.) Vein filled with carbonate are observed. Sphene and ore are accessories. Ore is magnetite only and fairly abundantly.	
321	No.3. 50.0	Quartz diorite	Large crystals of plagioclase and hornblende from the equigranular texture. Hornblende is sometimes enclosing plagioclase giving a poikilitic texture. Brownish green tint of hornblende is characteristic.	

Sample No.	Location	Rock name	Microscopic observation	Remarks
			Weak alteration by chlorite-carbonates-sericite (muscovite) and epidote can be observed. Fine aggregates of biotite and a little cummingtonite are seen. Saussuritization of plagioclase is found, especially in the basic core of each crystal. Dissemination of magnetite and very poor sulphide are present.	
322	No.3. 87.7	Limestone	Granulitic crystals of calcite are the main constituent. Also occur muscovite and clinopyroxene, the latter of which has perfectly been changed to chlorite or uralite, by hydroalteration. A little and minute grains of iron oxides are present.	
324	No.3. 91.6	Limestone	The rock is mainly composed of granular calcite with a little recrystallized quartz and a few quartz veinlets. Holocrystalline texture by granular calcite is seen to be the result of recrystallization. A little sulphides are disseminated.	
325	No.3. 96.1	Skarn	The rock is separated into the two parts. One part is mainly constructed by tightly cemented calcite with handsome shape. Another part is composed of garnet with many fractures filled by calcite. The transitional zone between two parts are composed of fine-grained calcite.	
327	No.3.105.0	Limestone	Main constituents is calcite, with a foliation characterized by the parallel arrangement of crystals (with an average grain size of 0.3 mm). It has banding of alteration of coarser-grained and finer-grained calcite layer. Very small amounts of quartz are also present. A little sulphides are disseminated mainly along with very fine-grained quartz.	
329	No.3.129.0	Skarn	The mineral association is calcite, iron oxide (magnetite), sulphides, quartz and a little amount of garnet. Quartz occurs in sporadic aggregate. Calcite veins are observed widely.	

Sample No.	Location	Rock name	Microscopic observation	Remarks
331	No.3.159.0	Skarn	The rock is chiefly composed of garnet. Garnet is distinctly fractured filling with calcite and quartz which are associated with ore. Chlorite aggregates possibly after actinolite are found. Magnetite are replaced by hematite and limonite.	
332	No.3.164.3	Hornfels of calcareous sandstone	The rock has a granulitic texture, composed mainly of recrystallized calcite and quartz. Detrital grains of feldspar are also found with irregular habit. Calcite veins are intruding. Leucoxene-sphene are fairly rich, and ore is very poor. A grain of epidote can be found.	
333	No.3.171.3	Aplite	The rock has a fine-grained and granulitic texture, composed of acidic plagioclase, orthoclase and quartz. Fine-grained biotites are also scattered. Apatite is one of the most aboundant accessorites. Secondary carbonate minerals are widely distributed.	
334	No.3.175.0	Gabbro	The texture is granular. Porphyritic crystals of olivine, which have been hydrated to serpentine mineral, is characteristic. Fine-grained crystals of clinopyroxene are present frequently. Veins filled with carbonates are penetrating.	
335	No.3.200.0	Granodiorite	The texture is medium-grained and weakly porphyritic. Mainly composing minerals are plagioclase (subhedral, up to 3 mm, with a varying composition from Ab70 An30 in the core to Ab90 An10 in the mantle. twinned on Carlsbad, albite and also Pericline law), greenish hornblende (subhedral, up to 1 mm, partly down graded to biotite) Quartz (interstitial, anhedral), and biotite. Hysterogene minerals are epidote, sericite, and calcite. Sphene, apatite and ore are common as accessories.	
336	No.3.211.0	Diorite	The rock, with an equigranular, holocrystalline and medium-grained texture, is composed of idiomorphic (usually calcic oligoclase) and biotite. Hysterogene minerals are calcite and chlorite, perfectly replacing the grains of biotite. Sphene is the minor accessory.	

Sample No.	Location	Rock name	Microscopic observation	Remarks
337	No.3.224.8	Granodiorite	The rock shows medium-grained, and weakly porphyritic. Main constituents are plagioclase (generally andesine, subhedral, up to 2 mm, with twin lamellation in the albite type often associated by pericline and Calsbad type), potassic feldspar (subhedral, up to 1 mm, always perthitic orthoclase), quartz (intestitial, anhedral), brownish biotite (subhedral, up to 0.5 mm) and greenish hornblende (subhedral, columnar, up to 1 mm). Hornblende and biotite have usually been decomposed to calcite and chlorite, respectively. Accessory minerals are sphene, apatite and ore minerals.	
338	DDH-3 236m - 248m	Porphyritic granodiorite	The rock is mainly composed of phenecrystic plagioclase (subhedral, up to 2 mm, twinned after albite, Carlsbad and pericline laws, weakly zoned), and finer-grained interstitial minerals such as quartz (anhedral, up to 0.5 mm), potash feldspar (anhedral, up to 0.5 mm), hornblende (subhedral, up to 0.3 mm, with a pleochroism of X = very pale green to colorless, Y = pale green and Z = green) and biotite (subhedral to anhedral, dark brown variety). Accessory minerals are sphene, apatite, zircon and opaque minerals. Feldspars are sericitized. Horablende is strongly altered to chlorite and epidote. Biotite is mostly altered to chlorite. Carbonate-filled veinlets cut the rock.	
339	No.3.250.0	Granodiorite	The rock, weakly porphyritic texture, is composed mainly of such minerals as plagioclase (subhedral, up to 2 mm, having an content of Ab 30), perthitic orthoclase, quartz, greenish hornblende and brownish biotite. Secondary alteration products are epidote, calcite and chlorite. Apatite, spene and ore are associated.	
341	No.4. 18.5	Quartz monzonite porphyry	Phenocrysts of plagioclase, orthoclase and biotite are in the holo-crystalline groundmass of quartz and feldspar. The rock is poor in mafic minerals. Large crystal of plagioclase is euhedral, with the grain size up to 3 mm, generally oligoclase to andesine, weakly zoned, and twinning after albite and Carlsbad law. Saussuritizition is partly seen. As secondary minerals, carbonate is fairly present. A little sericite is also present. Ore-quartz-calcite veinlets are found.	

Sample No.	Location	Rock name	Microscopic observation	Remarks
342	No.4. 20.0	Quartz monzonite porphyry	Phenocrysts of plagioclase (subhedral, up to 3 mm, zoned from oligoclase to andesine) and brownish biotite are present in quartz-feldspathic groundmass. Saussuritization is distinctly observed in plagioclase. Accessories are quartz, carbonate and a little amount of sericite-chlorite.	
344	No.4. 49.9	Quartz monzonite porphyry	Phenocrysts of plagioclase (subhedral, up to 3 mm, zoned), potassic feldspar (subhedral, up to 2 mm, perthitic orthoclase) and biotite (idiomorphic, brownish) present in the holocrystalline quartz-feldspathic groundmass. Secondary calcite, chlorite, leucoxene and sericite are found.	
346	No.4. 63.5	Quartz monzonite porphyry	Relatively large crystals of plagioclase and sometimes of potassic feldspar, with brownish biotite, are enclosed in a fine-grained crystalline quartz-feldspathic groundmass. Plagioclase is zoned with the composition varying from Ab70 An30 to Ab80 An20, and twinned with idiomorphic character. Potassic feldspar is always perthitic orthoclase. Biotite is subhedral, with brownish tinge. Garnet, calcite and ore are frequently present, and also sericite-chlorite are rarely found.	
347	No.4. 64.8m	Quartz monzonite porphyry	Phenocrysts of plagioclase (subhedral, up to 2 mm, generally twinned after albite and Carlsbad laws and less commonly after pericline law, weakly zoned), and microphenocrysts of biotite (subhedral to anhedral and rarely tabular flake up to 0.3 mm, with a pleochroism of X = pale yellow and Y,Z = dark brown) and altered hornblende are in a fine-grained hollocrystalline groundmass (up to 0.1 mm in size) of anhedral quartz, potash feldspar and plagioclase. Accessory minerals are apatite, sphene and opaque minerals. Feldspars are weakly to moderately carbonitized and sericitized. Hornblende is completely altered to opaque minerals, carbonates and/or epidote. Biotite is weakly chlorized. Frequently carbonate veinlets cut the rock.	

Sample No.	Location	Rock name	Microscopic observation	Remarks
349	No.4. 70.0	Quartz monzonite porphyry	The mineral association is porphyritic orthoclase and fine grained quartz with small amount of plagioclase. Veins filled with quartz, calcite and ore are penetrating, and rare sericite is present. The rock is affected by weak deformation.	
350	No.4. 90.0	Quartz monzonite porphyry	Phenocrysts of plagioclase (subhedral, up to 3 mm, with an An content varying from 40 in the core to 20 at the mergin of the grains) associated with perthitic orthoclase and brownish biotite is enclosed in a quartz-feldspathic groundmass with a granular texture. Accessory minerals are sphene and apatite.	
351	No.4.131.2	Quartz monzonite porphyry	Phenocrysts of plagioclase (subhedral, up to 2 mm) and biotite (subhedral, perfectly altered to chlorite and carbonate) are present in holocrystalline groundmass of quartz and feldspars. Saussuritization of plagioclase is seen to be distinct. As secondary products, calcite, quartz, clay and a little quartz are found.	
352	No.4.142.3	Quartz monzonite porphyry	The texture is hypidiomorphic. Main constituents are plagioclase, potassic feldspar and interstitial quartz. Plagioclase is porphyritic, attaining to be 5 mm, with an An content of 30 to 40. Potassic feldspar is always perthitic orthoclase. Biotite could have been present, but is now decomposed to the aggregates of carbonate, sericite and leucoxene.	
353	No.4.166.3	Quartz monzonite porphyry	Phenocrysts of plagioclase (subhedral, up to 3 mm, twinned after and pericline law) with minor amount of perthitic orthoclase are in the groundmass. Biotite has perfectly altered to calcite and leucoxene. Secondary calcite is widely developed. The saussuritization of this rock is strong.	
354	No.4.177.3	Quartz monzonite porphyry	Enclosed are phenocrysts of plagioclase, perthitic orthoclase and biotite, in the fine-grained holocrystalline groundmass of quartz and feldspar. Hornblende might occur, but has now been altered to calcite. Plagioclase is zoned and twinned. Epidote and sphene are accessory. Some part of secondary biotite is altered to carbonate, and other is completely fresh.	

Sample No.	Location	Rock name	Microscopic observation	Remarks
355	No.4.183.6	Quartz monzonite porphyry	The texture is porphyritic. Fine-grained groundmass composed of quartz, plagioclase and perthitic orthoclase is enclosing phenocrysts of plagioclase with smaller amount of orthoclase. Porphyritic plagioclase is twinned and zoned. Essential ferromagnesian minerals are pale greenish hornblende and biotite, the former of which has partly been altered into calcite and leucoxene. As an accessory, there are sphene, apatite and ore (magnetite).	
356	DDH 4. 192 - 204m	Quartz monzonite porphyry	The petrographic characters are essentially same as those of the specimen No. 335, but the amount of potash feldspar of the former is much less than that of the latter.	
358	No.4.220.0	Quartz monzonite porphyry	Porphyritic plagioclase (subhedral, up to 3 mm) and potassic feldspar (subhedral, up to 5 mm, perthitic orthoclase, sometimes enclosing plagioclase and quartz) with small amounts of ferromagnesian minerals of pale greenish hornblende and biotite are characteristic. Caclite-bearing calcite vein in which magnetite is disseminated and found, and pyrite-chalcopyrite are disseminated along.	
359	No.4.221.1	Quartz monzonite porphyry	Phenocrysts of plagioclase (subhedral, up to 5 mm) and usually oligoclase) and perthitic orthoclase (not so fragment) are enclosed in the fine-grained groundmass of quartz and feldspars. Biotite and pale greenish hornblende, each of which are partly altered to chlorite and calcite, alternatively, are also essential. A little secondary quartz and sericite are present.	
360	No.4.239.6	Quartz monzonite porphyry	The rock is holocrystalline, equigranular and medium-textured. Main constituents are plagioclase (subhedral, up to 3 mm, usually andesine), perthitic orthoclase (up to 2 mm) and interstitial quartz, with brownish and partly chloritized biotite. Apatite and sphene are also associated.	

Sample No.	Location	Rock name	Microscopic observation	Remarks
362	No.5. 67.3	Meta-gabbro	The rock can be separated into two parts. One part is holocrystalline and equigranular. Clinopyroxenes (subhedral, up to 4 mm, partly alters to brownish biotite) cummingtonite (subhedral, up to 4 mm, colorless to pale greenish in tint) and plagioclase (subhedral, up to 1 mm) occur. Large crystal of sphene (up to 2 mm) is characteristic. Another part is also holocrystalline. It contains plagioclase (subhedral, up to 2 mm, commonly labradorite), clinopyroxene (up to 2 mm, with the frake of hornblende) and hornblende (subhedral, brownish green) are common. Cummingtonite is formed secondarily. The rock shows an poikilitic texture by plagioclases enclosed in the hornblende. Hystorogene minerals are epidote and chlorite. Sphene and ore are common accessory minerals.	
363	No.5.84.5	Gabbro	The hypidiomorphic equigranular texture is characteristic. Clinopyroxene, brownish green hornblende and plagioclase (subhedral, up to 3 mm) are the main constituent. Epidote-green amphybole-magnetite veins are found, and also a few of latest calcite veins.	
364	No.5. 98.5	Gabbro	The texture is equigranular and hypidiomorphic. Widely developed are idiomorphic clinopyroxene, brownish green hornblende and plagioclase. The grained biotite is produced, due to the break down of hornblende. Greenish amphibole is formed near the mergin of the crystals of brownish hornblende in the second stage. Basic core of plagioclase is altered to epidote. Veins filled with epidote, green amphybole and magnetite penetrate the rocks. Accessory sphene and ore are found.	
365	No.5.122.7	Diorite	The texture is seen to be hypidiomorphic and equigranular, having an poikilitic texture formed by plagioclase laths enclosed in the brownish hornblende. The most aboundant minerals are plagioclase (subhedral, up to 2 mm, zoned), microcline and hornblende (subhedral, up to 4 mm, with a distinct pleochroism of X = yellowish, Y = reddish brown, Z = reddish brown). Greenish hornblende and brownish biotite formed along the cleavage or surrounding the grains of brownish hornblende may be the product of secondary alteration. Secondary carbonates and chlorite are common. Cummingtonite is also formed. As an accessory minerals, it contains sphene apatite and ore.	

Sample No.	Location	Rock name	Microscopic observation	Remarks
366	No.5.132.0	Altered diorite	The rock is constituted by idiomorphic plagioclase, biotite and quartz. Aggregates of fine-grained biotite which is fairly fresh but partly weak chloritized, show the effect of secondary thermal alteration. The rock has many fractures, sometimes filled with calcite, and has the strong alteration of carbonitization and sericitization. Carbonate is later stage product than biotite and sericite. Fresh sphene and a little epidote are found.	
367	No.5.172.0	Gabbro	The rock is composed chiefly of common hornblende with brownish tinge. Pale greenish to colorless and fibrous amphibole associated with sulphide develop mantling around the brownish hornblende. Minor amount of sericitized and argillized plagioclase is associated. Secondary chlorite and talc is widely present. Veinlets filled with calcite penetrate.	
369	No.5.188.9	Altered gabbro	The texture is equigranular, holocrystalline and medium grained. Main constituents are acidic plagioclase with Carlsbad and Percline twinning. Saussuritization is to be seen distinctly. Quartz does not attain large size. Calcite, epidote and biotite are formed due to secondary alteration. Biotite is fine- grained and frequently aggregate. Accessories are sphene and ore.	
370	No.5.210.0	Olivine basalt	Phenocrysts of olivine (euhedral to subhedral, tabular, up to 0.5 mm altered wholly to iddingsite and carbonate) and augite (more aboundant than olivine, subhedral, up to 1 mm, distinctly zoned) are in a holocrystalline, fine-grained groundmass of lath shaped plagioclase, olivine and augite. Zeolite and carbonate are filling the dressy cavitites.	
371	No.5.240.0	Altered diorite	The rock with a holocrystalline texture has the mineral association of feldspars, biotite and quartz. Secondary alteration is so distinct that biotites are perfectly decomposed of chlorite and plagioclase are replaced to sericite. As an accessory mineral, there are ore and apatite.	

Sample No.	Location	Rock name	Microscopic observation	Remarks
372	No.5.250.0	Diorite	Medium grained plagioclase and hornblende are the main constituents. Plagioclase is much saussuritized. Hornblende is brownish in tint but altered to greenish from its fringe. Cummingtonite is also present in place of hornblende. Veins filled with calcite and quartz are penetrating. Sericitization and carbonization of plagioclase along veins are observed, and also chloritization of biotite-hornblende.	
373	No.6. 31.0	Hornblende gabbro	The texture is equigranular and holocrystalline. Hornblende encloses the feldspar crystals, giving an poikilitic texture. Idiomorphic plagioclase (weak sericitized) is bytownite to labradorite with the twin lamellation of the albite type often accompanied by Carlsbad and pericline types. Individual hornblende crystal is so large as to reach 10 mm, showing distinct pleochroism of X = yellowish, Y =brownish, Z = greenish brown. Cummingtonite also occurs in a second stage. Essential biotite had been presented but must be recrystallized to the masses of fine-grained biotite, which now has partly been altered to chlorite along calcite veinlets. Hysterogene carbonate (crack or parting filling veinlets) and chlorite are present.	
374	No.6. 74.8	Calcite vein	It is composed of large amount of calcite and quartz. Secondary chlorite has been scattered. The texture is equigranular. Some sulphides can be observed.	
375	No.6. 80.5	Altered diorite	The rock has composed mainly of plagioclase, perthitic orthoclase and fine-grained matrix. It is altered to give the assemblage of biotite and actinolite (biotite > actinolite). As a hysterogene mineral, there occurs greenish chlorite and carbonate. Accessory minerals are sphene and ore.	
376	No.6. 93.3	Hornblende gabbro	The rock is holocrystalline, hypidiomorphic-granular texture. Plagioclase is frequently twinned. Subhedral clinopyroxene occur mantled with greenish hornblende. Essential greenish brown hornblende and biotite has partly been decomposed to biotite of fine-grained.	

Sample No.	Location	Rock name	Microscopic observation	Remarks
			Secondary alteration product of epidote (fairly rich), carbonate, sulphide and chlorite are formed universally. Accessory minerals are sphene, minor amount of sericite, and ore.	
377	No.6. 97.0	Hornblende gabbro	Essential constituent minerals are clinopyroxene, hornblende and plagioclase. Large crystal of brownish hornblende always enclosed lath-shaped plagioclase showing poikilitic texture. Clinopyroxene is mantled by greenish hornblende. Plagioclase is twinned after albite, Pericline and Carlsbad law. Commonly developed are fine-grained aggregates of brownish biotite, due to the secondary thermal effect. Cummingtonite also occurs replacing the grain of brownish hornblende. Chlorite, carbonate, epidote and a little sulphide are hysterogene. Secondary biotite and magnetite are fairly rich.	
378	No.6.113.7	Hornblende gabbro	The mineral association is hornblende (with ophitic texture, up to 5 mm, with a pleochroism of X = brown, Y = greenish brown, Z = brown), clinopyroxene (subhedral, altered to hornblende from its margin) and plagioclase (subhedral, with and average grain size of 1 mm, sometimes porphyritic, zoned). Biotite is also essentially present, but not so fragment. Secondary biotite of fine-grained occur, along the veinlets or replacing essential ferromagnesian minerals. Cummingtonite is produced in the second stage. Magnetite is replaced to a little sulphide associated with epidote-chlorite.	
379	No.6.114.4	Hornblende gabbro	The rock is equigranular and medium-grained. Some hornblende attain a large size of 6 mm, enclosing of plagioclase. Plagioclase is zoned, mainly labradorite but having the core of bytownite and twinned. Clinopyroxene, sometimes having a "schiller" striation is mantled by brownish green hornblende. Secondary cummingtonite and biotite replace the primary hornblende. The rock may be suffered by the thermal alteration. Two kind of veinlets (one of latest carbonate veinlet, other of sulphide ore-chlorite-(calcite)-(quartz)-veinlet) are observed and chlorite (after biotite) are observed.	

Sample No.	Location	Rock name	Microscopic observation	Remarks
380	No.6.116.0	Gabbro	The rock is composed mainly of orthopyroxene, clinopyroxene and olivine. Widely developed are secondary minerals such as talc and cummingtonite. Fairly amounts of muscovite-sericite are also present. Hysterogene minerals are carbonates-quartz, chlorite and serpentinite.	
381	No.6.117.0	Altered diorite	The rock is equigranular, composed essentially of plagioclase, biotite and hornblende. Fine grained aggregates of biotite occur perfecting essential mafic minerals. It contains minor accessory of sphene and ore (chalcopyrite orbornite). Last stage alteration products are epidote, chlorite and carbonate. The rock is affected by the weak alteration.	
382	No.6.128.0	Gabbro	Hypidiomorphic, granular texture is seen. Most frequently occur clinopyroxene (subhedral to euhedral, up to 10 mm, partly replaced by colorless amphibole), and plagioclase (subhedral, up to 2 mm). A grain of brownish hornblende is also present. Several aggregates of biotite-ore (magnetite) replacing mafic minerals are present, and large sulphide-magnetite and calcite-sulphide-epidote ore, too. Hydrothermal product of the final stage is a little of chlorite, sericite and epidote. A few of this veinlets of calcite cut the ore.	
383	No.6.135.6	Gabbro	The texture is seen to be equigranular, hypidiomorphic and medium-grained. Main constituents are diserete crystals of plagioclase (subhedral, up to 1 mm, having a central core of bytownite decreacing of An content at the edges), clinopyroxene (subhedral, up to 1 mm, sometimes retains in the core of hornblende) and hornblende (enclosing plagioclase to give poikilitic texture, up to 3 mm, with a pleochroism of X = brown, Y = greenish brown Z = greenish brown, downgraded to greenish amphibole). Small amount of secondary biotite and chlorite (after biotite) are observed. Two kind of ore (one of sulphide-calcite-quartz, other of magnetite-secondary biotite). Biotite occurs secondarily, in place of clinopyroxene and hornblende, suggesting the thermal effect.	

Sample No.	Location	Rock name	Microscopic observation	Remarks
384	No.6.166.1	Gabbro	Main constituent mineral is plagioclase, brownish hornblende and clinopyroxene. Plagioclase has an An content of 70. And is sometimes enclosed in clinopyroxene. Cummingtonite is widely formed in the second stage. Colorless amphibole is also found. Olivine might have been present, but has now been decomposed. Chlorite and carbonates are hysterogene.	
385	No.6.234.0	Gabbro	The rock is composed mainly of plagioclase (usually labradorite) and brownish hornblende with a poikilitic texture. Essential clinopyroxene and biotite may be present. Secondary biotite and colorless amphibole occur, due to the thermal effect. Sericite, carbonate and chlorite are hysterogene minerals. Quartz bearing sulphide-calcite vein are observed.	
386	No.6.237.6	Gabbro	Main constituents are plagioclase (subhedral, up to 2 mm, zoned), hornblende (subhedral, up to 3 mm, with poikilitic texture enclosing plagioclase, showing a distinct pleochroism of X = brownish, Y = deep brown, Z = greenish brown). Fine grained aggregates of biotite and coloeless amphibole (disseminated magnetite with them) are suggested the secondary thermal alteration on the rock. Also discernible are signs of deformation such as penetrating veinlets of twisted plagioclase (montmorillonite and sericitization along veins) quartz with wavy extinction and carbonate. Saussuritization of plagioclase is seen to be distinct. Barren quartz-calcite veins are present.	
388	No.6.250.3	Hornblende gabbro	The most abundant minerals are plagioclase, hornblende and clinopyroxene. Plagioclase has zoned texture and twinning. Hornblende shows brownish tint, with subhedral shape. Greenish hornblende may be secondary. Penetrate veins filled with quartz and carbonate. Ore is magnetite only.	

Sample No.	Location	Rock name	Microscopic observation	Remarks
29	C-17M	Monzonite porphyry	Principal ore mineral is subhedral to euhedral pyrite. As accessory minerals, minor amounts of molybdenite is also present. Subhedral to euhedral pyrite occur as veinlets in acidic volcanics (or plutons).	
29	C-17M(P)	Monzonite porphyry	Principal ore mineral is subhedral to euhedral pyrite. As accessory minerals, chalcopyrite is included in pyrite. Pyrite veinlets with orientation are characteristic of the specimen.	
30	C-20R	Granodiorite	Principal ore minerals are chalcopyrite and magnetite. As accessory minerals, pyrite and hematite, replacing magnetite, are present. Chalcopyrite and magnetite occur as dissemination. Magnetite with minor hematite are euhedral to subhedral.	
55	F'-37M	Granodiorite	Principal ore minerals are galena with minor amounts of covelline rim. Galena occurs as dissemination. Colloformed texture displayed by gangue is well-developed.	
64	G'-18M	Iron oxide	Principal ore minerals are chalcopyrite, hematite and pyrite. Chalcopyrite is replaced and rimmed by secondary minerals such as covelline. Bladed hematite occurs as vein-filling materials. Ore textures suggest that specular hematite may be considered to be of late stage than that of chalcopyrite and pyrite.	
66	G-21M	Magnetite skarn	Principal minerals are magnetite and hematite. As accessory minerals, pyrite is present Magnetite intergrown with hematite by which magnetite is partially replaced. Some magnetite completely replaced by newly-formed bladed hematite.	
74	G'-21M	Magnetite skarn	Principal ore mineral is magnetite. As accessory minerals, hematite is present. Magnetite with euhedral form or bloded shape is partially replaced by hematite along the fracture in magnetite grain.	
87	I'-24R	Skarn	Principal ore mineral is bladed and irregularly-shaped hematite. As accessory minerals, relict of pyrite and magnetite is also observed.	

Sample No.	Location	Rock name	Microscopic observation	Remarks
89	I'-40(2M)	Iron ore	Principal ore minerals are hematite and magnetite. Hematite pseudomorph after magnetite is characteristic. Replace rimnant of magnetite exists in a small amount.	
93	I'-25M	Magnetite skarn	Principal ore mineral is magnetite. As accessory minerals, chalcopyrite and pyrite grains are included in magnetite host. Magnetite occurs as veinlets, spacefilling materials, and as dissemination. Lattice-like hematite in magnetite is characteristic.	
128	N'-22(S1)	Magnetite skarn	As principal ore minerals, hematite and magnetite are present. As accessory minerals, chalcopyrite occurs in a small amounts. Magnetites are observed to be replaced or cross-cut by (secondary) hematite.	
201	Trench	Copper sulphide ore	Principal ore mineral is bornite. As accessory minerals, covelline and supergene minerals are observed to replace bornite. Replace remnant of bornite is a mass with finely rhythmic band is characteristic.	
202	Trench	Copper sulphide ore	Principal ore mineral is bornite. As accessory mineral, covelline and anisotropic phase (unidentified) are present. They occur at the bornite margin, suggestively the secondary formation.	
302	No.1. 63.6	Porphyritic granodiorite	Principal ore minerals are pyrite, specular hematite, and chalcopyrite. Euhedral to subhedral pyrite and bladed hematite are common. Pyrite-hematite veinlet is associating with a small amount of chalcopyrite. Chalcopyrite including small pyrites is cross-cut by chalcocite.	
303	No.1. 64.3	Molybden bearing porphyrite granodirite	Principal ore minerals are specular hematite and pyrite. Molybdenite may be present in small amounts. Because of much difficulty of making polished section of the specimen, microscopic observation was impossible to do.	

Sample No.	Location	Rock name	Microscopic observation	Remarks
309	No.1.141.7	Cataclastic granodiorite	Principal ore mineral is hematite. As accessory minerals, magnetite is also present. Needle-like hematite with a minor amounts of magnetite occurs as vein and dissemination.	
311	No.1.231.3	Cataclastic granodiorite	Principal ore minerals are pyrite and specular hematite. Euhedral to subhedral pyrite with or without bladed hematite occur as veinlets in volcanics. Cataclastic texture is characteristic of hematite.	
313	No.2. 60.5	Copper bearing monzonite porphyry	Principal ore minerals are pyrite and chalcopyrite. Pyrite shows euhedral to subhedral. As accessory mineral, covelline is present. Chalcopyrite is replaced and rimmed by tiny covelline, occuring as dissemination.	
314	No.2. 74.0	Copper bearing hornfels	Almost all of ore mineral is chalcopyrite in various grain size. Chalcopyrite, obliquely cutting or in part paralleling with the band of wall rock, occurs as veinlet as dissemination.	
316	No.2.117.5	Molybden & copper bearing monzonite porphyry	Principal ore minerals are chalcopyrite and pyrite. As accessory mineral a minor molybdenite is present. They occur as veinlets is present. They occur as veinlets or dissemination. Pyrite is euhedral to subhedral shape.	
318	No.2.158.9	Copper bearing hornfels of sandstone	Principal ore mineral is subhedral to anhedral pyrite. As accessory minerals small amounts of chalcopyrite are present. They occur as dissemination or fine veinlets.	
319	No.2.172.6	Copper bearing granodiorite	Principal ore minerals are pyrite and chalcopyrite. As accessory minerals, hematite and molybdenite are present. A part of euhedral to subhedral pyrite and chalcopyrite in association with small molybdenite occur as dissemination. Molybdenite or hematite with pyrite are filling veinlets.	

Sample No.	Location	Rock name	Microscopic observation	Remarks
320	No.3. 41.1	Magnetite bearing gabbro	Principal ore mineral is magnetite. Magnetite is subhedral to euhedral shape. As accessory minerals, hematite is also present. Exsolution-like texture, that is lattice intergrowth of magnetite and hematite is often observed. Such a texture is considered to be formed due to oxidation of magnetite. Magnetite occurs as dissemination or separate grains.	
324	No.3. 91.6	Lead & copper bearing gabbro	Principal ore minerals are chalcopyrite and pyrite. As accessory minerals, a minor amount of galena is present. Chalcopyrite associating with euhedral to subhedral pyrite occurs as veinlets and dissemination in limestone recrystallized.	
325	No.3. 96.1	Copper bearing skarn	Principal ore minerals are bornite and chalcopyrite. As accessory minerals, minor amounts of secondary phase, chalcocite, is observed to replace bornite. Bonite in association with chalcopyrite occurs as space-filling materials and as dissemination, often cut by secondary veinlets. Bornite with or without chalcopyrite is also present in the carbonate vein.	
327	No.3.107.7	Copper bearing limestone	Principal ore minerals are bornite and chalcocite. As accessory minerals, small amounts of covelline replacing bornite is observed. Bornite myrmekitic (?) intergrowth with chalcocite occurs as dissemination in the recrystallized limestone.	
330	No.3.136.7	Copper bearing skarn	Principal ore minerals are bornite, chalcopyrite and chalcocite. As accessory minerals, a minor covelline is present. Bornite grain with or without chalcopyrite has rim as a results of replacement, occuring as veinlets or dissemination in the granite, garnet skarn.	
341	No.4. 18.5	Quartz monzonite porphyry	Principal ore minerals are bornite, chalcopyrite and partially oxidized magnetite. Euhedral to subhedral magnetite which is partially or entirely replaced by hematite occur as dissemination. Chalcopyrite associating with bornite occurs as veinlets and dissemination.	

Sample No.	Location	Rock name	Microscopic observation	Remarks
347	No.4. 64.8	Quartz monzonite porphyry	Principal ore minerals are bornite and chalcopyrite. As accessory minerals, hematite pseudomorph after magnetite is also present. Small amounts of chalcocite is included in bornite. Bornite with or without chalcopyrite occurs as veinlet and dissemination.	
349	No.4. 70	Quartz monzonite porphyry	Principal ore minerals are chalcopyrite and bornite. As accessory minerals, minor molybdenite in association with chalcopyrite and bornite is present. Bornite intimately intergrown with chalcopyrite occurs as space-filling materials or veinlets.	
353	No.4.166.3	Quartz monzonite porphyry	Principal ore minerals are chalcopyrite and hematite. Hematite replacing magnetite occurs as separate grain, while chalcopyrite with or without hematite pseudomorph as dissemination.	
354	No.4.177.3	Copper bearing monzonite porphyry	Principal ore minerals are chalcopyrite and magnetite. Magnetite which is partially replaced by hematite occurs as dissemination, while chalcopyrite as dissemination and space-filling materials.	
358	No.4.220	Copper bearing quartz monzonite porphyry	Principal ore minerals are chalcopyrite and magnetite. As accessory minerals, small amounts of pyrite is included in chalcopyrite. Hematite occurs as replacement of magnetite. Chalcopyrite with minor pyrite occurs as dissemination, while magnetite with or without chalcopyrite as dissemination and veinlets.	
362	No.5. 67.3	Meta-gabbro	Principal ore minerals are bornite, chalcopyrite and magnetite. As accessory minerals, hematite partially replacing magnetite is present. Bornite occurs as veinlets and dissemination, while magnetite as separate grains. Bornite replaced by chalcocite, is characteristic.	
363	No.5. 84.5	Gabbro	Principal ore minerals are magnetite and chalcopytite. As accessory minerals, small amounts of pyrite with chalcopyrite is present. Minor amounts of hematite occurs as replacement of magnetite. Chalcopyrite with or without magnetite occurs as space-filling materials, while magnetite as dissemination and separate grain.	

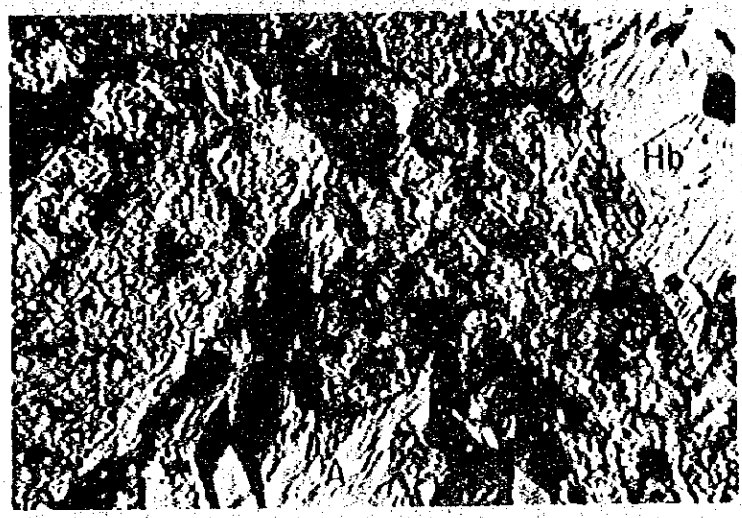
Sample No.	Location	Rock name	Microscopic observation	Remarks
364	No.5. 98.5	Gabbro	Principal ore minerals are chalcopyrite, pyrite and magnetite. As accessory minerals, bornite in association with chalcopyrite is present. Small molybdenite is also found. Magnetite partially replaced by hematite occurs as dissemination, while chalcopyrite with or without magnetite as space-filling materials.	
365	No.5.122.7	Diorite	Principal ore minerals are chalcopyrite, magnetite and pyrite. Magnetite is partially oxidized to hematite. Chalcopyrite with or without pyrite and magnetite occurs as veinlets and dissemination.	
366	No.5.132.0	Altered diorite	Principal ore minerals are bornite, chalcocite and molybdenite. As accessory minerals, small chalcopyrite associating with bornite in present. Bornite-chalcocite with or without molybdenite occurs as veinlets and dissemination.	
367	No.5.172.0	Copper bearing gabbro	Principal ore minerals are pyrite, chalcopyrite and magnetite. Chalcopyrite associating with pyrite and/or magnetite occurs as veinlets and as dissemination.	
369	No.5.188.9	Altered gabbro	Principal ore minerals are chalcopyrite, bornite and magnetite. Myrmekitic intergrowth of chalcopyrite and bornite is observed. Chalcopyrite in association with bornite and or magnetite occurs as dissemination and interstice-filling materials.	
373	No.6. 31.0	Copper bearing hornblende gabbro	Principal ore minerals are bornite, magnetite and chalcopyrite. Subhedral to euhedral magnetite occur as dissemination, while bornite with exsolution of chalcopyrite in the form of lamellae as veinlet.	
374	No.6. 74.8	Calcite-vein	Principal ore minerals are chalcopyrite, pyrite and hematite pseudomorph after magnetite. As accessory minerals, minor tetrahedrite bleb is included in chalcopyrite. Concentration of euhedral to subhedral pyrite is characteristic of this specimen. Chalcopyrite in association with pyrite occurs as veinlets or as dissemination.	

Sample No.	Location	Rock name	Microscopic observation	Remarks
375	No.6. 80.5	Altered diorite	Principal ore minerals are chalcopyrite and magnetite. As an accessory mineral, pyrite is present. Chalcopyrite in association with subhedral to euhedral magnetite and/or pyrite occurs as veinlets and dissemination.	
376	No.6. 93.3	Copper bearing hornblende gabbro	Principal ore minerals are chalcopyrite, magnetite and bornite. As an accessory mineral, a minor amount of hematite replacing magnetite is present. Chalcopyrite associating with magnetite and bornite occurs as vein-filling or interstice-filling materials. Magnetite is euhedral to subhedral in form.	
377	No.6. 97.0	Copper bearing hornblende gabbro	Principal ore minerals are magnetite, bornite and chalcopyrite. As accesory minerals, small amounts of pyrite, sphalerite and chalcocite are present. Bornite with or without subhedral to euhedral magnetite occurs as veinlet and dissemination. Magnetite is partially replaced by hematite.	
379	No.6.114.4	Hornblende gabbro	Principal ore minerals are chalcopyrite, bornite and magnetite. Almost of all chalcopyrite intergrown with bornite occur as veinlets, while subhedral grains of magnetite as dissemination. The stage of deposition of Fe-O assemblage is thought to be different from that of Cu-Fe-S assemblage.	
381	No.6.117.0	Altered diorite	Principal ore minerals are chalcopyrite and pyrite. As accessory minerals, a small amount of magnetite is present. Chalcopyrite associating with euhedral to subhedral pyrite occurs as veinlet- or interstice- filling matrials.	
385	No.6.234.0	Gabbro	Principal ore minerals are magnetite and chalcopyrite. As accessory minerals, bornite and hematite replacing magnetite are present. Subhedral to euhedral magnetite occurs as separate grain, while chalcopyrite with bornite as veinlet and dissemination.	
388	No.6.250.3	Hornblende gabbro	Principal ore minerals are magnetite and bornite. As accessory minerals, a small amount of chalcopurite and chalcocite intergrown with bornite are present. Subhedral to euhedral magnetite with or without bornite occurs as veinlet and dissemination.	

Table I-11 List of photographs

Thin section

Sample No.	Location	Rock name
1	Z-11	Meta diorote
29	C-17M	Quartz monzonite
87	I-24R	Skarn
103	K-19S_1	Granite porphyry
118	M'-15S_2	Diorite
165	Q-23N_3	Meta gabbro
304	No. 1 68.0	Granodiorite
309	No. 1 141.7	Cataclastic granodiorite
312	No. 2 50.5	Quartzite
314	No. 2 74.0	Hornfels of slate
316	No. 2 117.5	Granite porphyry
317	No. 2 152.0	Olivine basalt
319	No. 2 172.6	Granodiorite
321	No. 3 50.0	Quartz diorite
322	No. 3 87.7	Limestone
325	No. 3 96.1	Skarn
332	No. 3 164.3	Hornfels of calcareous sandstone
333	No. 3 171.3	Aplite
334	N0. 3 175.0	Gabbro
367	No. 5 172.0	Gabbro



Sample No. 1

Rock Name
Meta-diorite

Location
Z-11

Hb : Brownish hornblende

P : Plagioclase

A : Colorless amphibole

Scale 1 mm

Crossed Nicols

Sample No. 29

Rock Name
Quartz monzonite

Location
C-17M

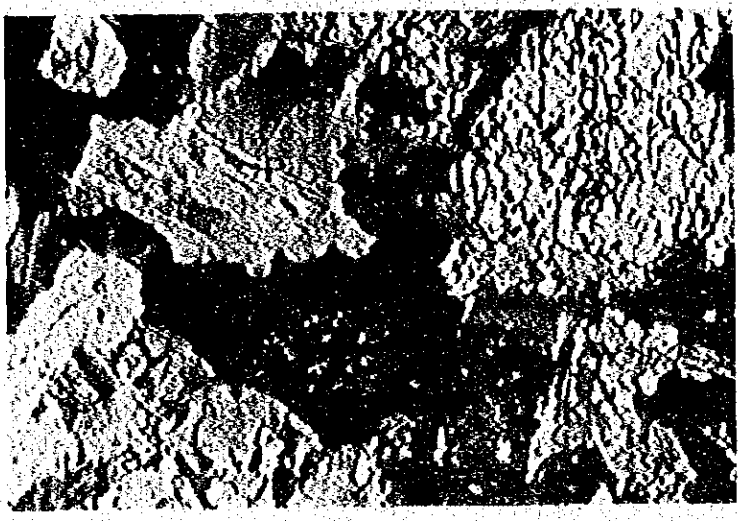
Q : Quartz

P : Plagiocalse

K : K-feldspar

Scale 1 mm

Crossed Nicols



Sample No. 118

Rock Name
Diorite

Location
M'-15 S2

P : Plagioclase

Cp : Clinopyroxene

Scale 1 mm

Crossed Nicols

Sample No. 165

Rock Name
Meta-gabbro

Location
Q-23N3

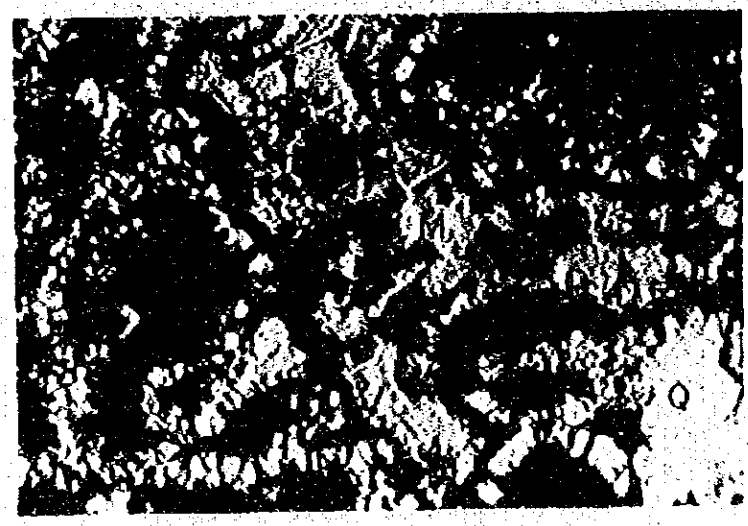
P : Plagioclase

Hb : Hornblende

Cp : Clinopyroxene

Scale 1 mm

Crossed Nicols



Sample No. 87

Rock Name
Skarn

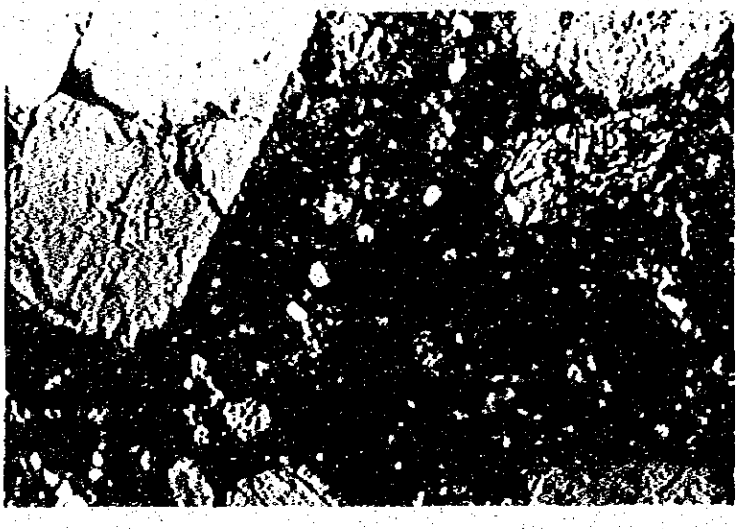
Location
I-24R

Q : Quartz

M : Malachite

Scale 1 mm

Crossed Nicols



Sample No. 103

Rock Name
Granite porphyry

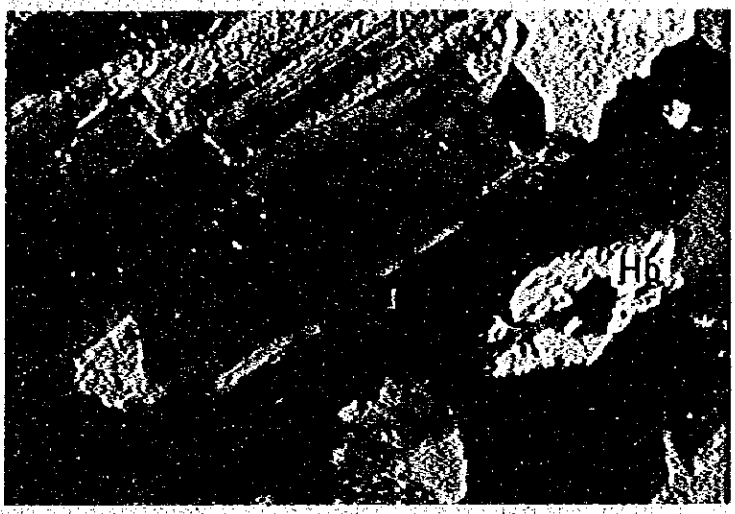
Location
K-19 S1

P : Plagioclase

Hb : Hornblende

Scale 1 mm

Crossed Nicols



Sample No. 304

Rock Name
Granodiorite

Location
DDH 1, 68.0m

P : Plagioclase

K : K-feldspar

Hb : Hornblende

Scale 1 mm

Crossed Nicols

Sample No. 309

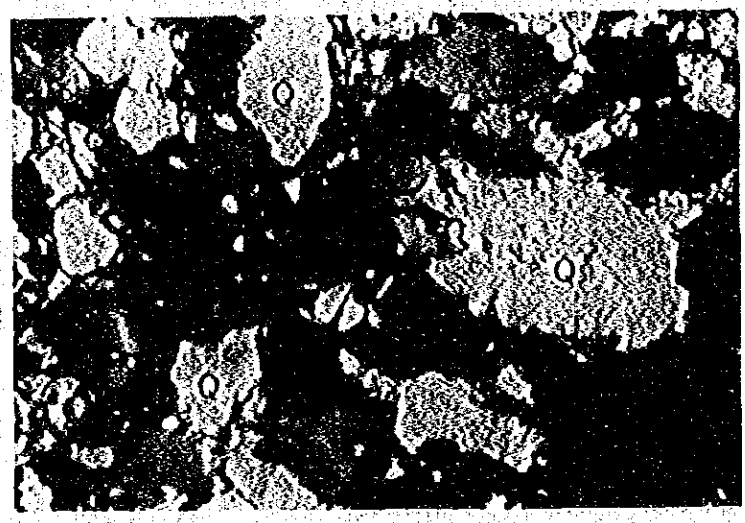
Rock Name
Cataclastic
Granodiorite

Location
DDH 1, 141.7m

P : Plagioclase

Scale 1 mm

Crossed Nicols



Sample No. 312

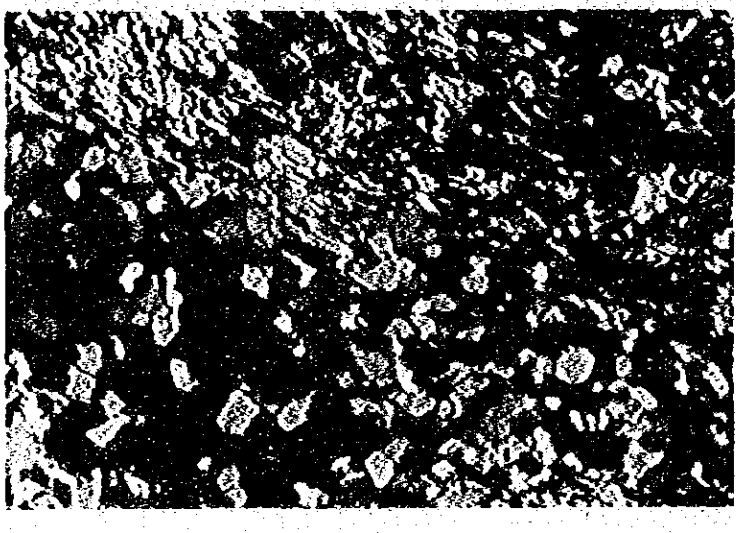
Rock Name
Quartzite

Location
DDH 2, 50.5m

Q : Quartz

Scale 1 mm

Crossed Nicols



Sample No. 314

Rock Name
Hornfels of slate

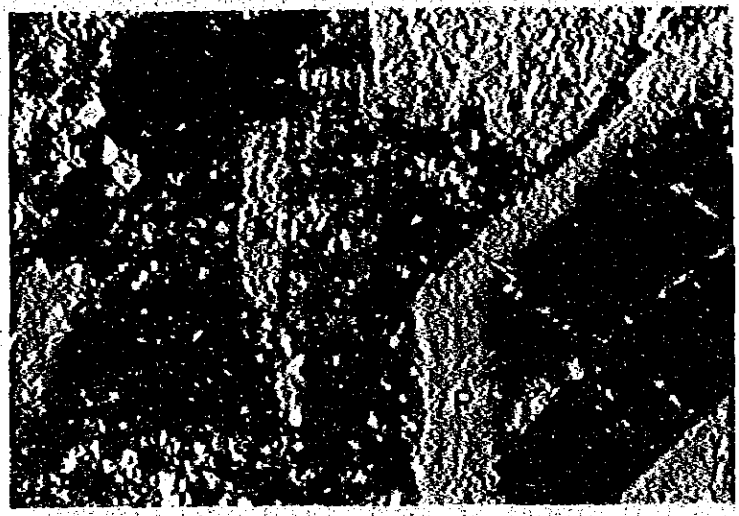
Location
DDH 2, 74.0m

Q : Quartz

W : White mica

Scale 1 mm

Crossed Nicols



Sample No. 316

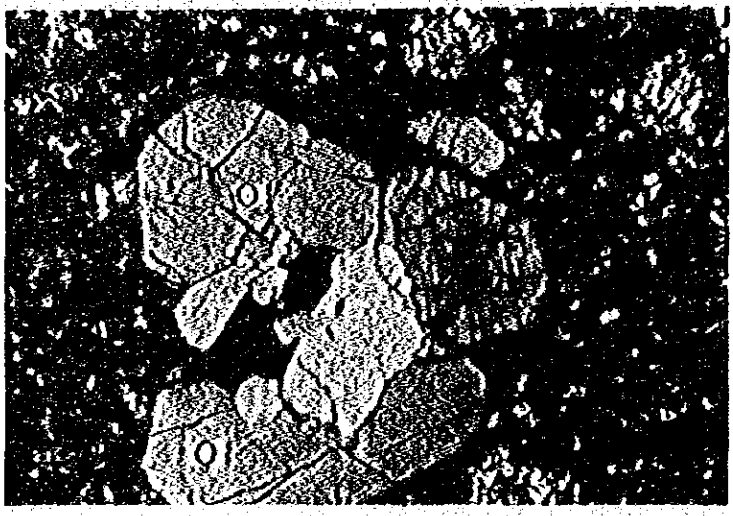
Rock Name
Granite porphyry

Location
DDH 2, 117.5m

P : Plagioclase

Scale 1 mm

Crossed Nicols



Sample No. 317

Rock Name
Olivine basalt

Location
DDH 2, 152.0m

Cp : Clinopyroxene

Ol : Olivine

Scale 1 mm

Crossed Nicols

Sample No. 319

Rock Name
Granodirite

Location
DDH 2, 172.6m

P : Plagioclase

Hb : Hornblende

Scale 1 mm

Crossed Nicols

Sample No. 321

Rock Name
Quartz diorite

Location
DDH 3, 50.0m

Q : Quartz

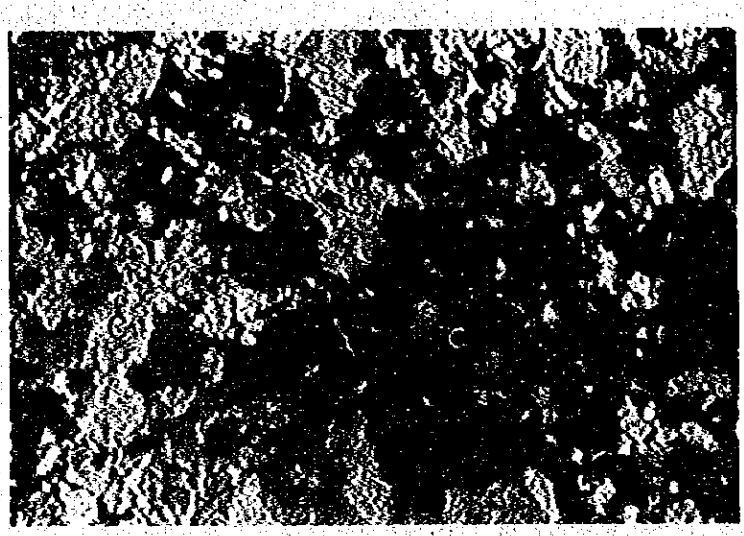
P : Plagioclase

Hb : Hornblende

B : Biotite

Scale 1 mm

Crossed Nicols



Sample No. 322

Rock Name
Limestone

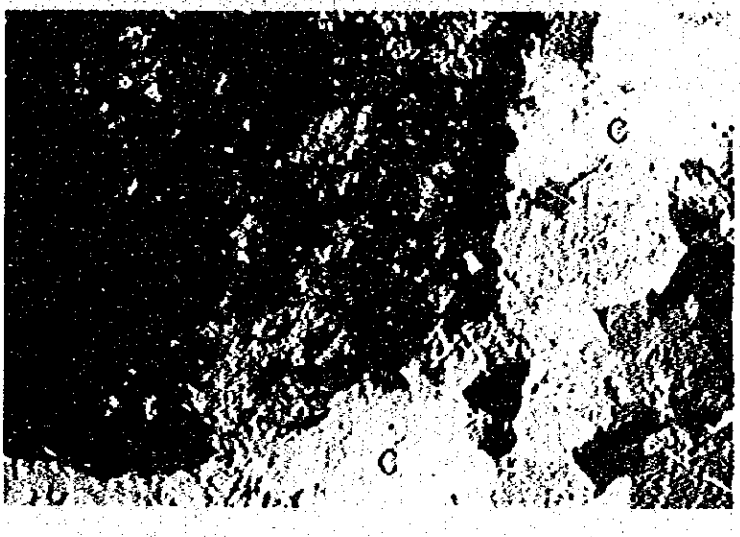
Location
DDH 3, 87.7m

C : Calcite

W : White mica

Scale 1 mm

Crossed Nicols



Sample No. 325

Rock Name
Skarn

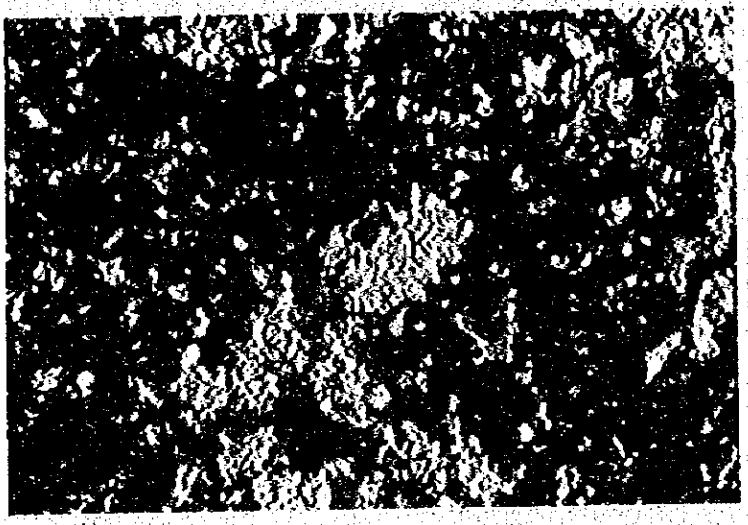
Location
DDH 3, 96.1m

C : Calcite

G : Garnet

Scale 1 mm

Crossed Nicols



Sample No. 332

Rock Name
Hornfels of calcareous sandstone

Location
DDH 3, 164.3m

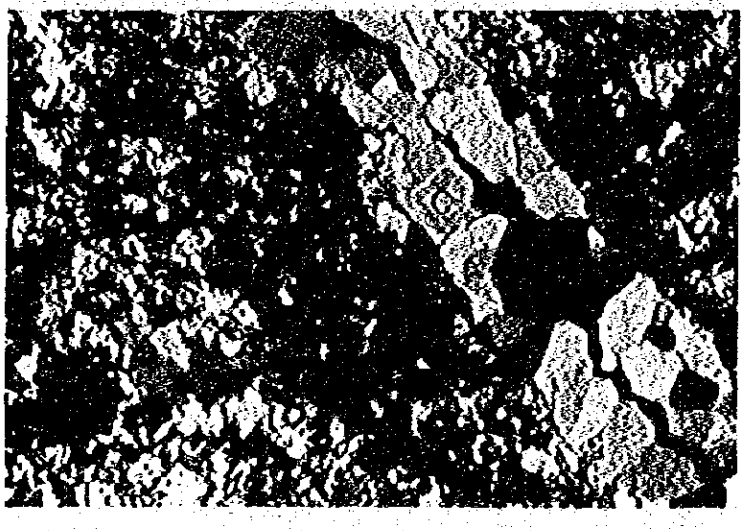
K : K-feldspar

Q : Quartz

C : Calcite

Scale 1 mm

Crossed Nicols



Sample No. 333

Rock Name
Aplite

Location
DDH 3, 171.3m

P : Plagioclase

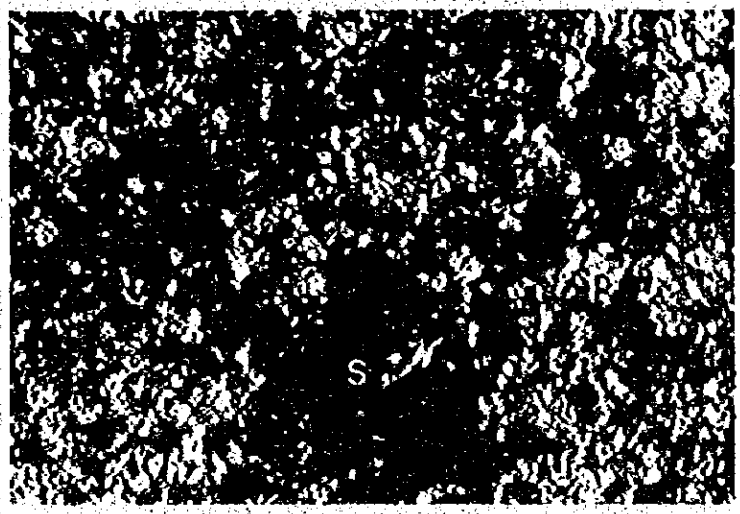
K : K-feldspar

Q : Quartz

C : Calcite vein

Scale 1 mm

Crossed Nicols



Sample No. 334

Rock Name
Gabbro

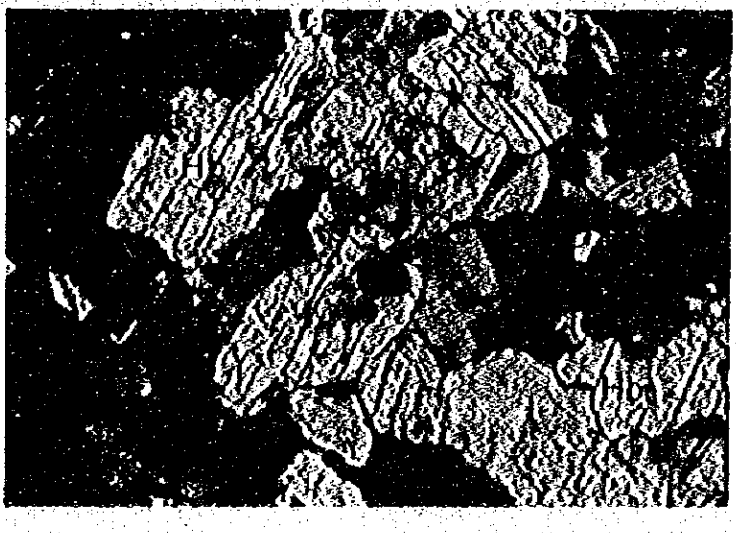
Location
DDH 3, 175.0m

Cp : Clinopyroxene

S : Serpentine aggregate

Scale 1 mm

Crossed Nicols



Sample No. 367

Rock Name
Gabbro

Location
DDH 5, 172.0m

Hb : Hornblende

P : Plagioclase

Scale 1 mm

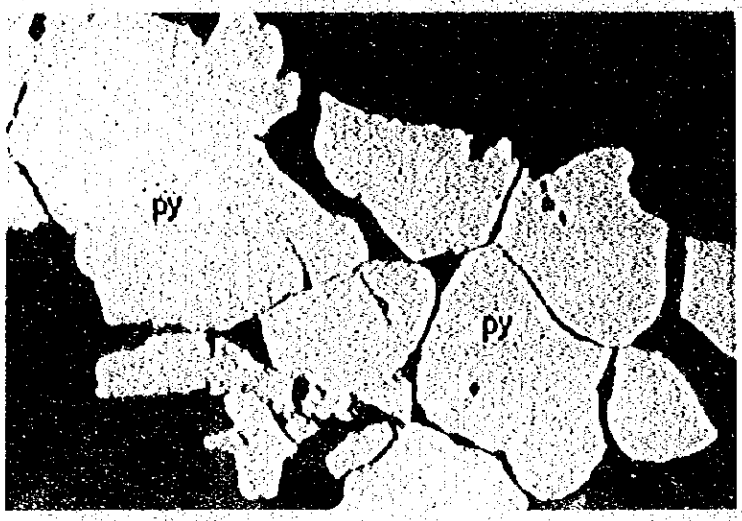
Crossed Nicols

Table I-11 List of microphotographs

Polished section

Sample No.	Location	Rock name
29	C-17M	Monzonite porphyry
29	C-17MP	Monzonite porphyry
30	C-20R	Granodiorite
55	F'-37	Granodiorite
64	G'-18M	Iron oxide
68	G-21M	Green copper
74	G'-21M	Magnetite skarn
74	G'-21(2M)	Magnetite skarn
87	I'-24	Skarn
89	I'-40(2M)	Iron ore
93	I'-25M	Magnetite skarn
128	H'-22Sl	Magnetite skarn
201	Trench pit	Copper sulphide ore
202	Trench pit	Copper sulphide ore
302	DDH 1. 63.6	Granodiorite
309	DDH 1. 141.7	Cataclastic granodiorite
311	DDH 1. 231.3	Cataclastic granodiorite
313	DDH 2. 60.5	Monzonite porphyry
314	DDH 2. 74.0	Hornfels of slate
316	DDH 2. 117.5	Monzonite porphyry
318	DDH 2. 158.9	Hornfels of sandstone
319	DDH 2. 172.6	Granodiorite
320	DDH 3. 41.1	Gabbro
324	DDH 3. 91.6	Skarn
325	DDH 3. 96.1	Skarn
327	DDH 3. 107.7	Limestone
330	DDH 3. 136.7	Skarn

Sample No.	Location	Rock name
341	DDH 4. 18.5	Quartz monzonite porphyry
347	DDH 4. 64.8	Quartz monzonite porphyry
349	DDH 4. 70.0	Quartz monzonite porphyry
353	DDH 4. 166.3	Quartz monzonite porphyry
354	DDH 4. 177.3	Quartz monzonite porphyry
358	DDH 4. 220.0	Quartz monzonite porphyry
362	DDH 5. 67.3	Meta gabbro
363	DDH 5. 84.5	Gabbro
364	DDH 5. 98.5	Gabbro
365	DDH 5. 122.7	Diorite
366	DDH 5. 132.0	Altered diorite
367	DDH 5. 172.0	Gabbro
369	DDH 5. 188.9	Altered gabbro
373	DDH 6. 31.0	Hornblende gabbro
374	DDH 6. 74.8	Calcite vein
375	DDH 6. 80.5	Altered diorite
376	DDH 6. 93.3	Hornblende gabbro
377	DDH 6. 97.0	Hornblende gabbro
379	DDH 6. 114.4	Hornblende gabbro
381	DDH 6. 117.0	Altered diorite
385	DDH 6. 234.0	Gabbro
388	DDH 6. 250.3	Hornblende gabbro



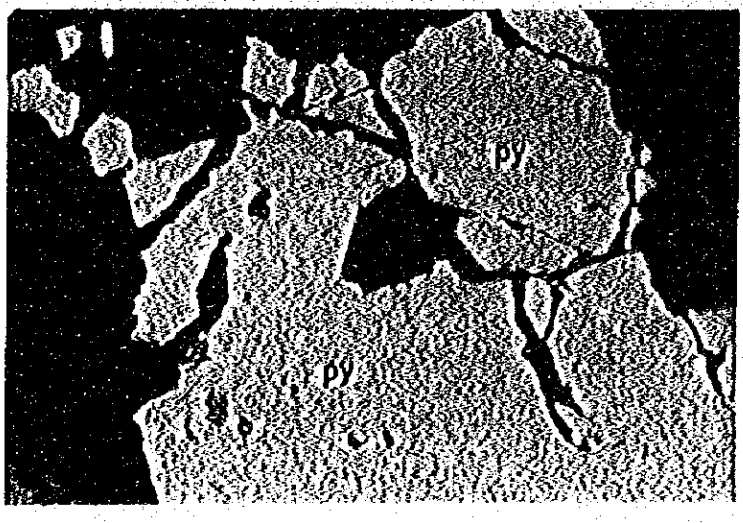
Sample No. 29

Rock name
Monzonite
porphyry

Location
C-17M

Py : Pyrite

Scale 0.5 mm



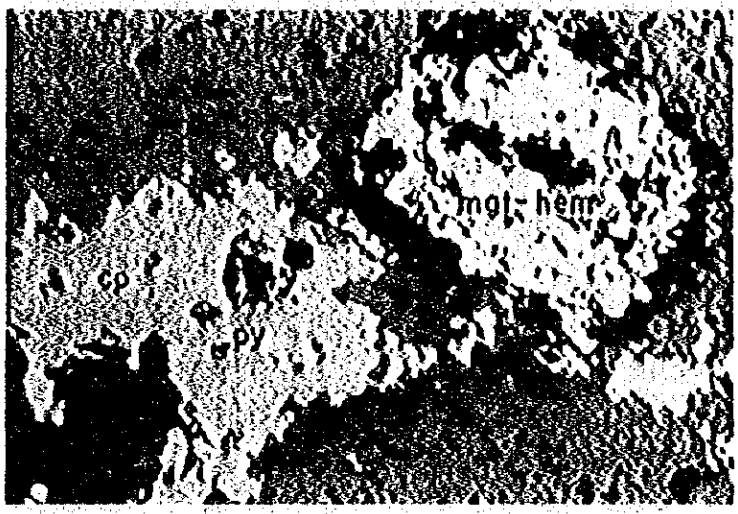
Sample No. 29

Rock name
Monzonite
porphyry

Location
C-17MP

Py : Pyrite

Scale 0.5 mm



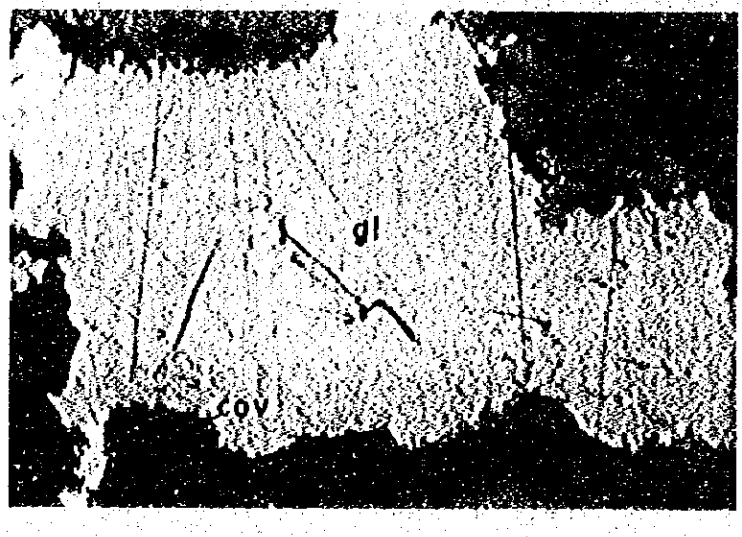
Sample No. 30

Rock name
Granodiorite

Location
C-20R

Cp : Chalcopyrite
Py : Pyrite
Mgt : Magnetite
Hem : Hematite

Scale
0.5 mm



Sample No. 55

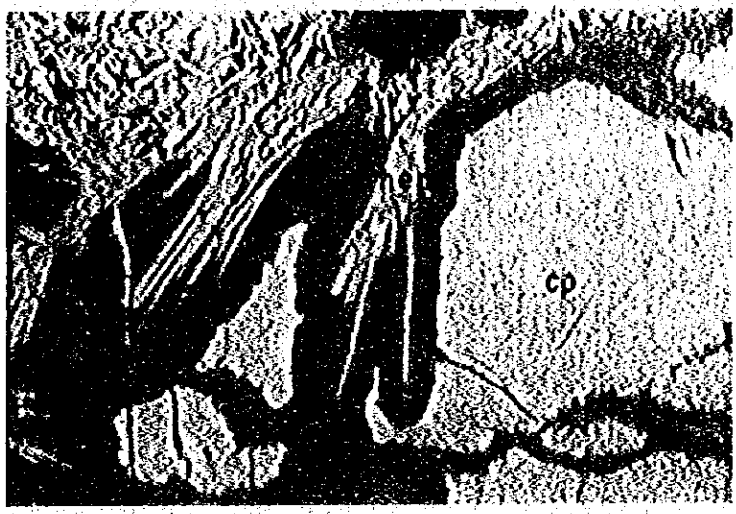
Rock name
Granodiorite

Location
F'-37

Gl : Galena

Cov. : Covelline

Scale
0.5 mm



Sample No. 64

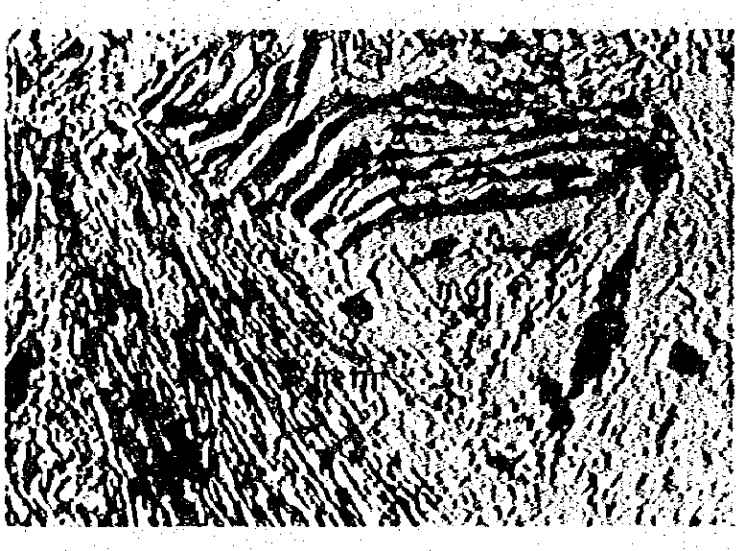
Rock name
Iron oxide

Location
G'-18M

Cp : Chalcopyrite

Hem : Hematite

Scale 0.5 mm



Sample No. 68

Rock name
Green copper

Location
G-21M

Hem : Hematite

Mgt. : Magnetite

Scale 0.5 mm

Sample No. 74

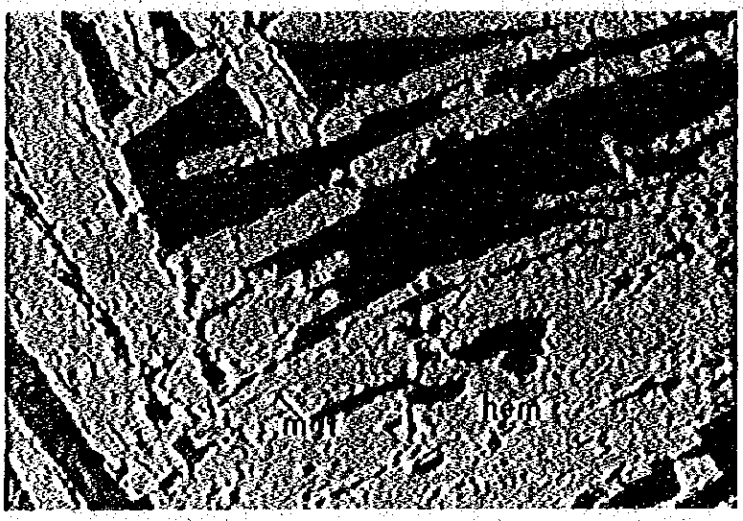
Rock name
Magnetite skarn

Location
G'-21M

Mgt : Magnetite

Hem : Hematite

Scale 0.5 mm



Sample No. 74

Rock name
Magnetite skarn

Location
G'-21M

Hem : Hematite

Mgt. : Magnetite

Scale 0.5 mm

Sample No. 87

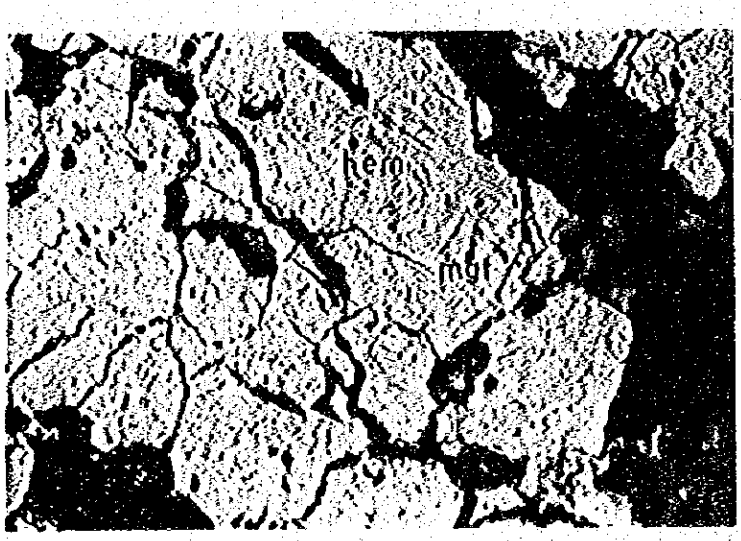
Rock name
Skarn

Location
I'-24R

Hem : Hematite

Scale

0.5 mm



Sample No. 89

Rock name
Iron oxide

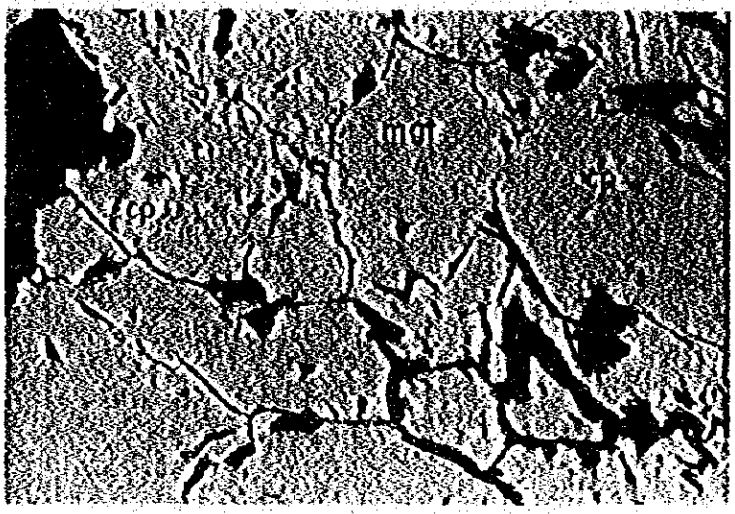
Location
I'-40(2M)

Hem : Hematite

Mgt. : Magnetite

Scale

0.5 mm



Sample No. 93

Rock name
Magnetite skarn

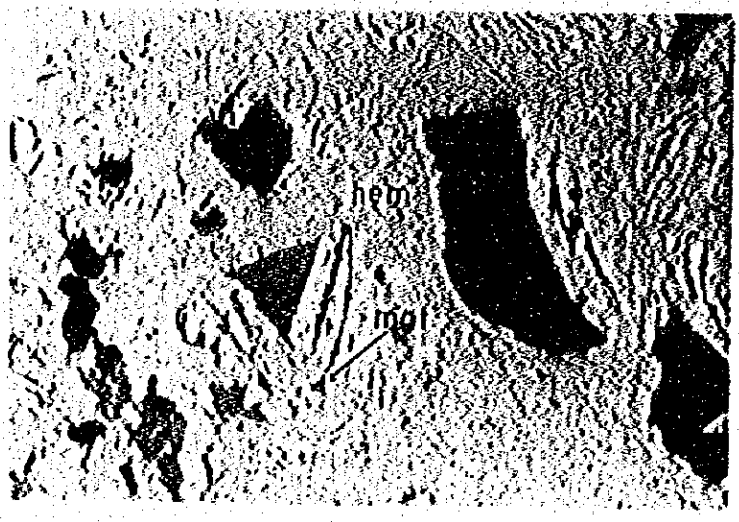
Location
P'-25M

Cp : Chalcopyrite

Mgt : Magnetite

Scale

0.5 mm



Sample No. 128

Rock name
Magnetite skarn

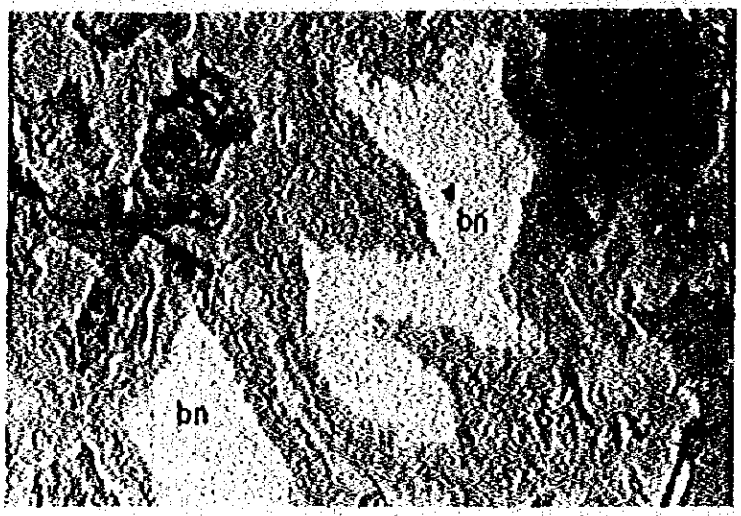
Location
N'-22S1

Hem : Hematite

Mgt : Magnetite

Scale

0.5 mm



Sample No. 201

Rock name
Copper sulphide ore

Location
Trench pit

bn : bornite

Scale 0.5 mm

Sample No. 202

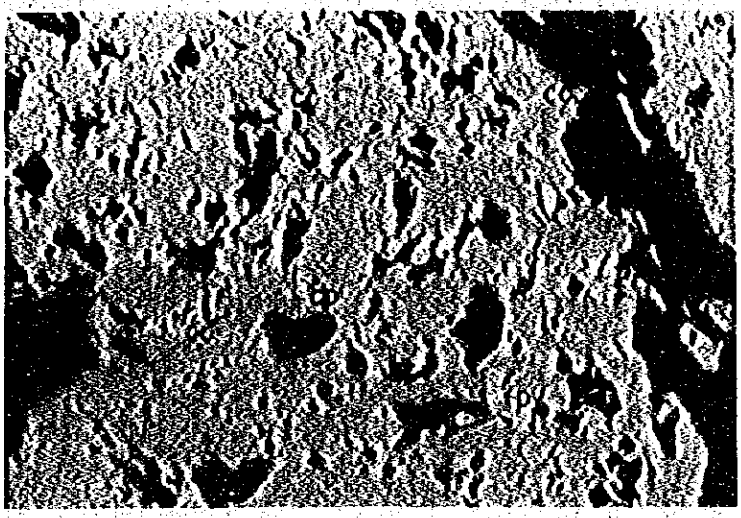
Rock name
Copper sulphide ore

Location
Trench pit

bn : bornite

Cov : Covelline

Scale 0.5 mm



Sample No. 302

Rock name
Granodiorite

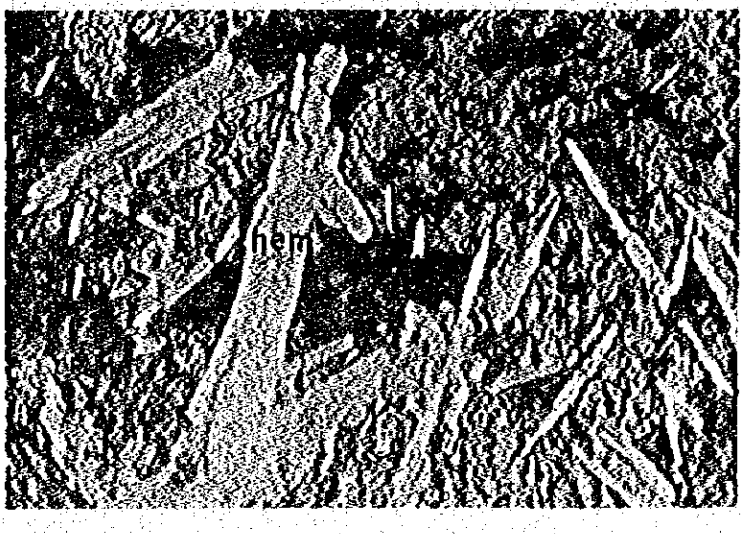
Location
DDH 1. 63.6m

Cc : Chalcocite

Py : Pyrite

Cp : Chalcopyrite

Scale 0.5 mm



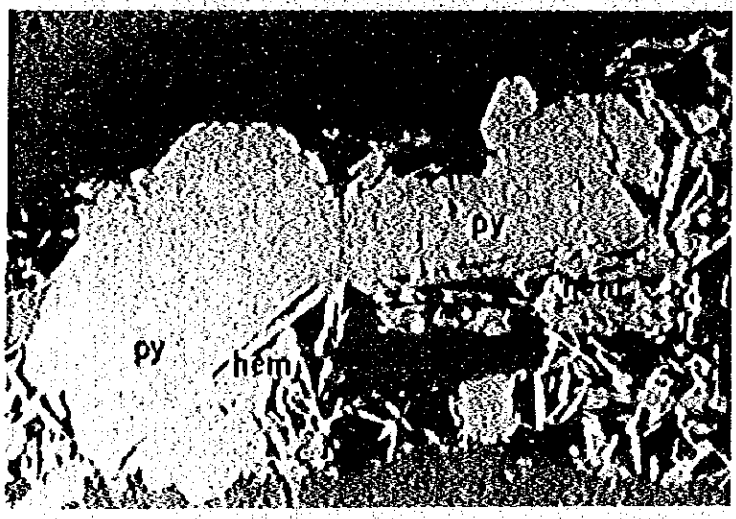
Sample No. 309

Rock name
Cataclastic
granodiorite

Location
DDH 1. 141.7m

Hem : Hematite

Scale 0.5 mm



Sample No. 311

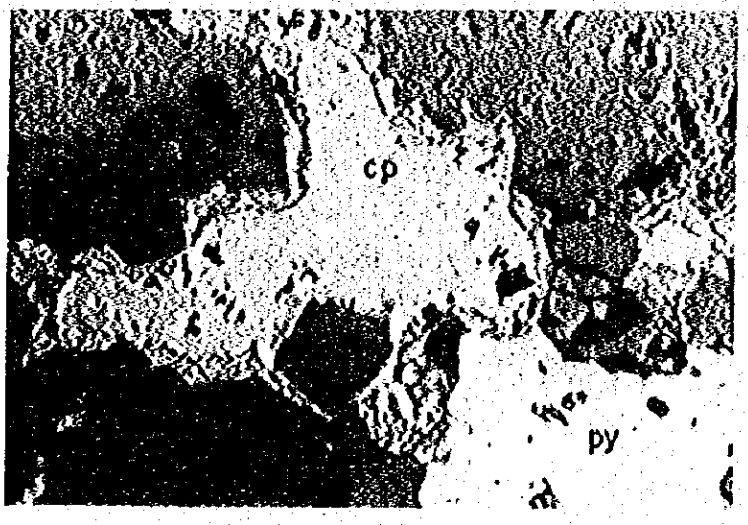
Rock name
Cataclastic granodiorite

Location
DDH 1, 231.3m

Py : Pyrite

Hem : Hematite

Scale 0.5 mm



Sample No. 313

Rock name
Monzonite porphyry

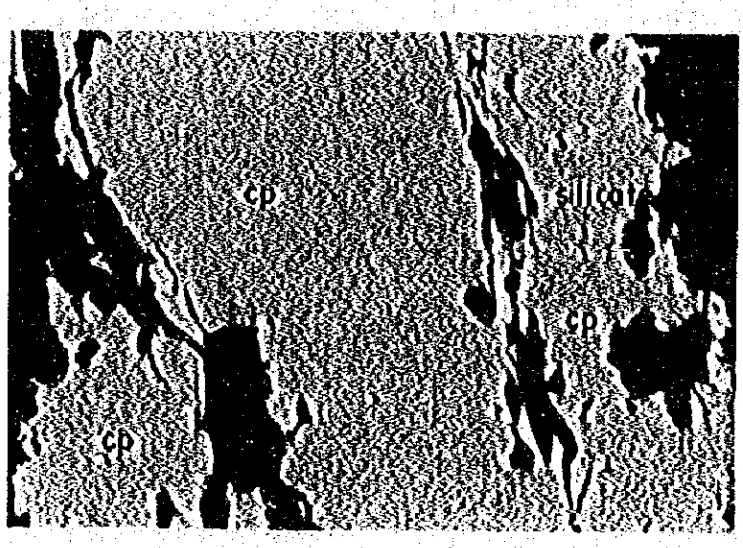
Location
DDH 2, 60.5m

Cp : Chalcopyrite

Py : Pyrite

Cov : Covelline

Scale 0.5 mm



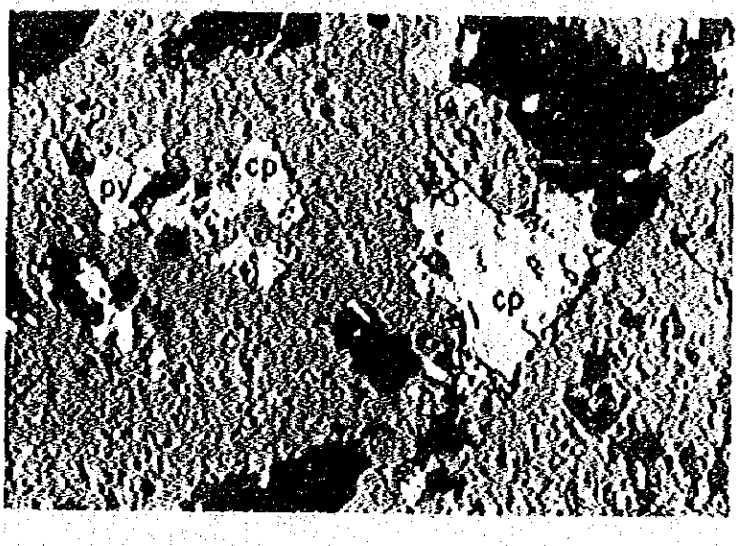
Sample No. 314

Rock name
Hornfels of slate

Location
DDH 2. 74.0m

Cp : Chalcopyrite

Scale 0.5 mm



Sample No. 316

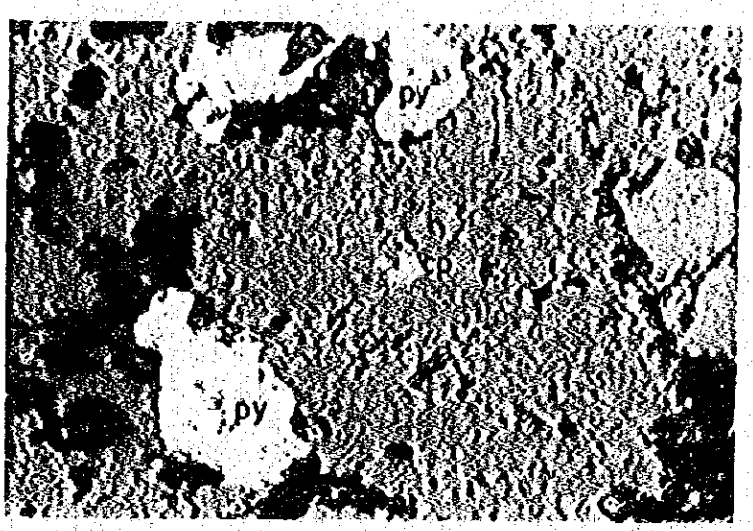
Rock name
Monzonite
porphyry

Location
DDH 2. 117.5m

Cp : Chalcopyrite

Py : Pyrite

Scale 0.5 mm



Sample No. 318

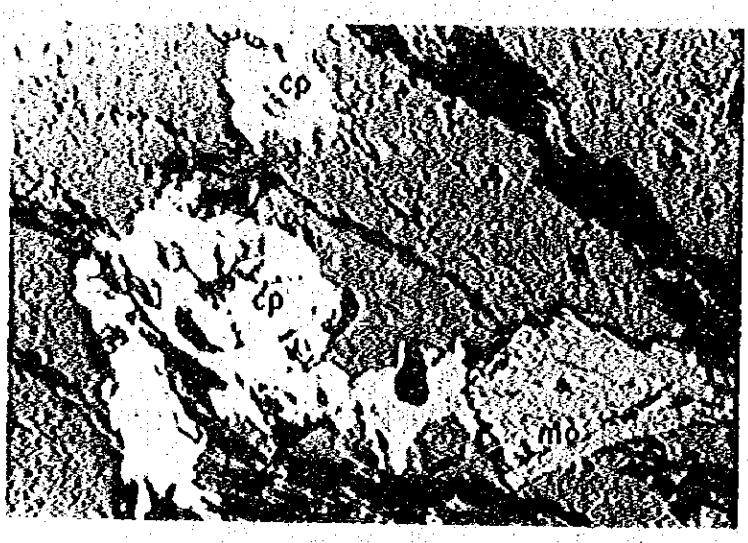
Rock name
Hornfels of sandstone

Location
DDH 2, 158.9m

Cp : Chalcopyrite

Py : Pyrite

Scale
0.5 mm



Sample No. 319

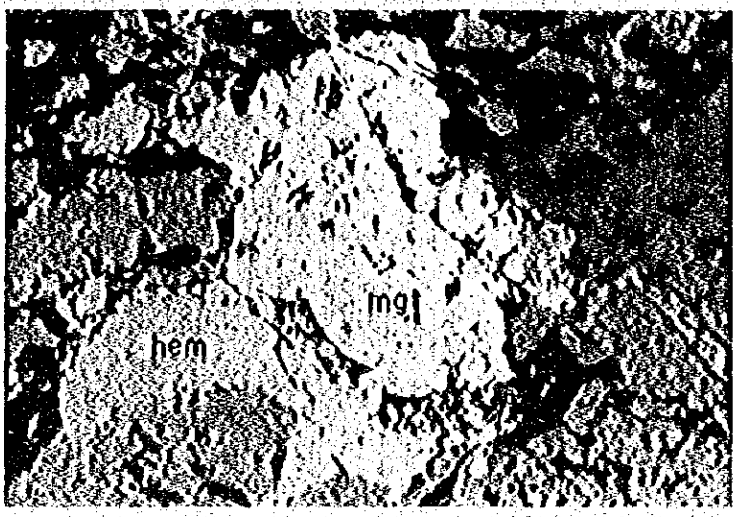
Rock name
Granodiorite

Location
DDH 2, 172.6m

Cp : Chalcopyrite

Mo : Molybdenite

Scale
0.5 mm



Sample No. 320

Rock name
Gabbro

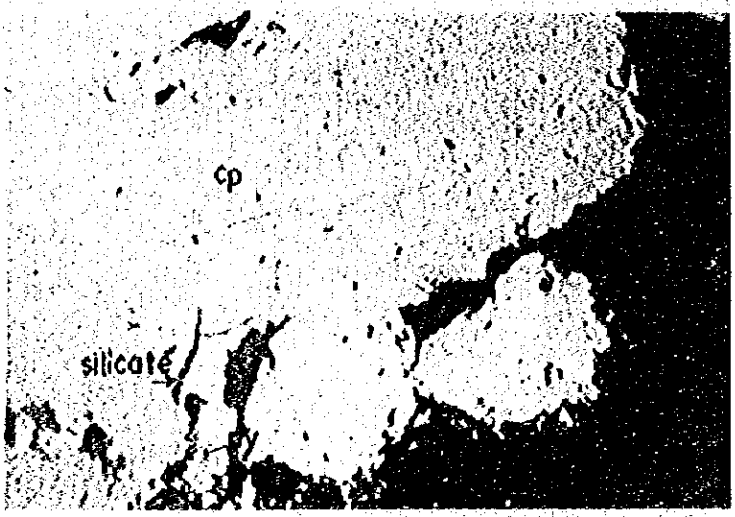
Location
DDH 3. 41.1m

Mgt : Magnetite

Hem : Hematite

Scale

0.5 mm



Sample No. 324

Rock name
Skarn

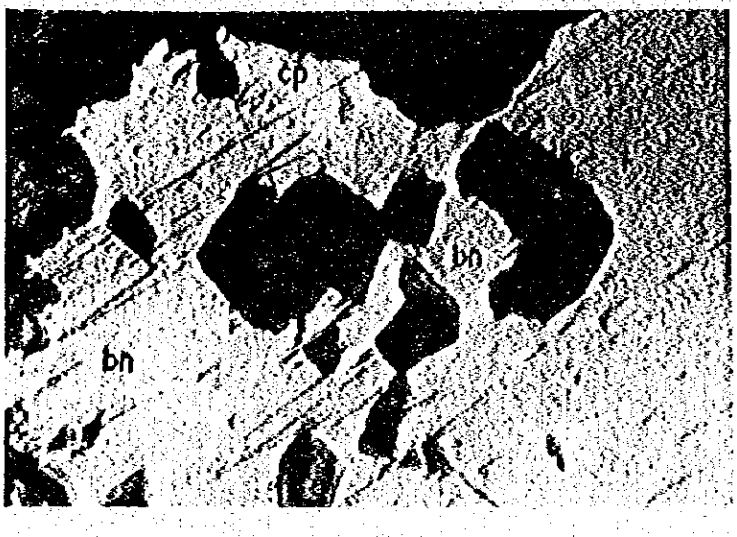
Location
DDH 3. 91.6m

Cp : Chalcopyrite

Py : Pyrite

Scale

0.5 mm



Sample No. 325

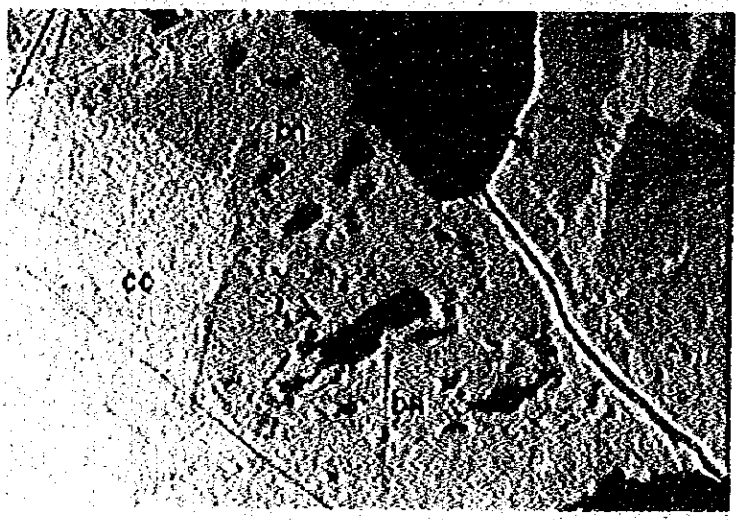
Rock name
Skarn

Location
DDH 3. 96.1m

bn : Bornite

Cp : Chalcopyrite

Scale 0.5 mm



Sample No. 327

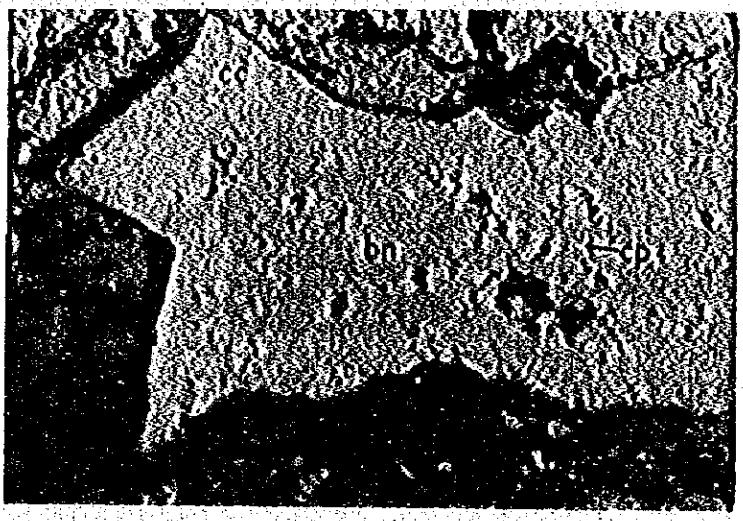
Rock name
Limestone

Location
DDH 3. 107.7m

bn : Bornite

cc : Chalcocite

Scale 0.5 mm



Sample No. 330

Rock name
Skarn

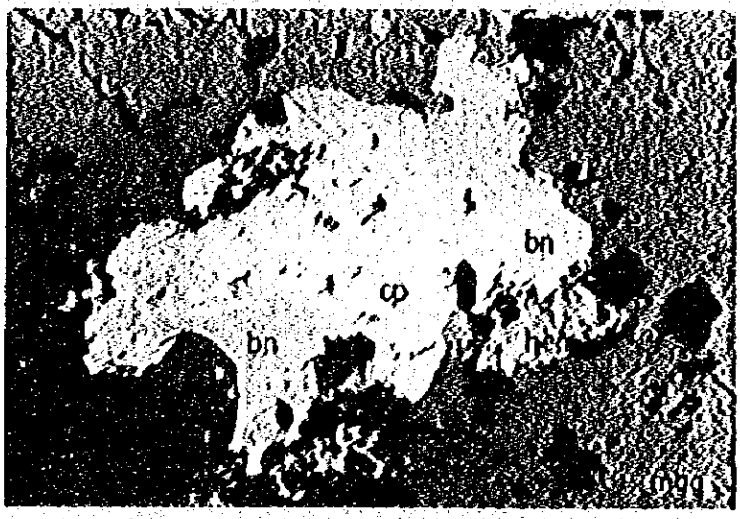
Location
DDH 3, 136.7m

bn : Bornite

cc : Chalcocite

cp : Chalcopyrite

Scale 0.5 mm



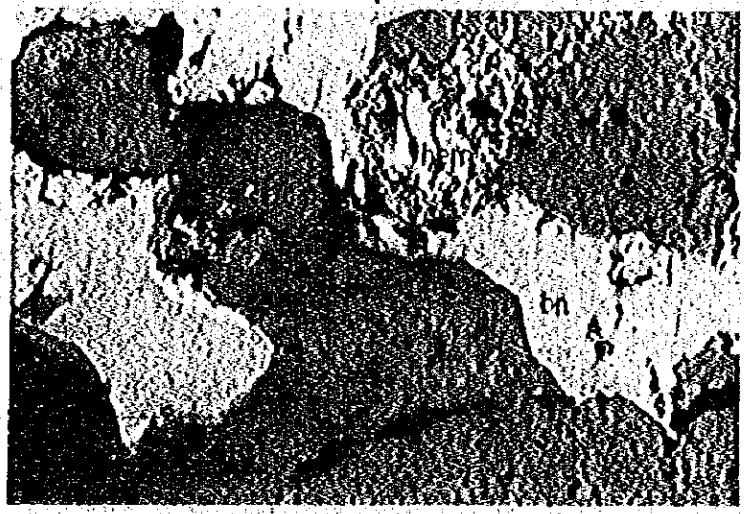
Sample No. 341

Rock name
Quartz monzonite porphyry

Location
DDH 4, 18.5m

bn : Bornite
cp : Chalcopyrite
hem : Hematite
mag : Magnetite

Scale 0.5 mm



Sample No. 347

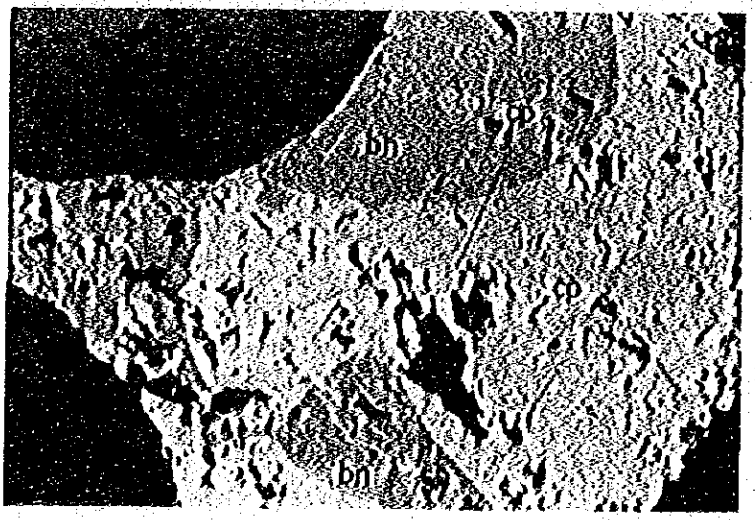
Rock name
Quartz monzonite porphyry

Location
DDH 4, 64.8m

bn : Bornite

cp : Chalcopyrite

Scale 0.5 mm



Sample No. 349

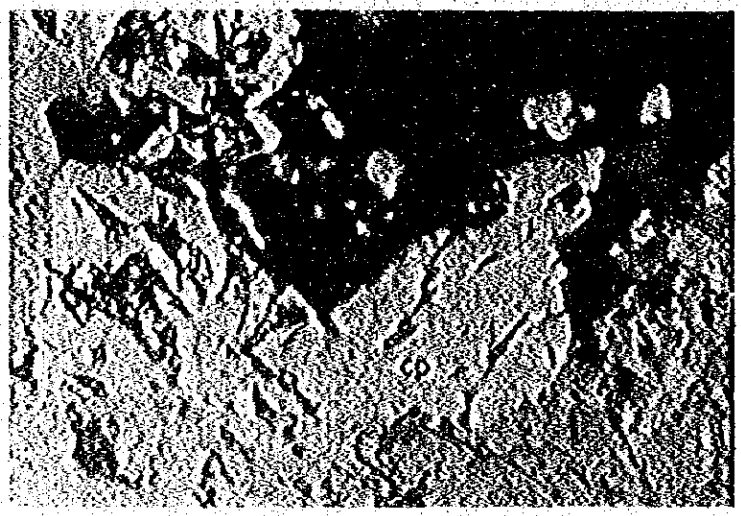
Rock name
Quartz monzonite porphyry

Location
DDH 4, 70.0m

cp : Chalcopyrite

bn : Bornite

Scale 0.5 mm



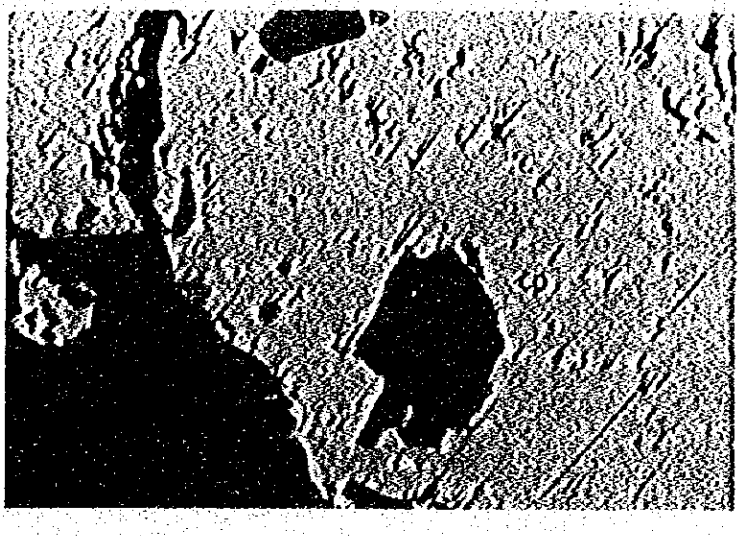
Sample No. 353

Rock name
Quartz monzonite porphyry

Location
DDH 4. 166.3m

cp : Chalcopyrite

Scale 0.5 mm



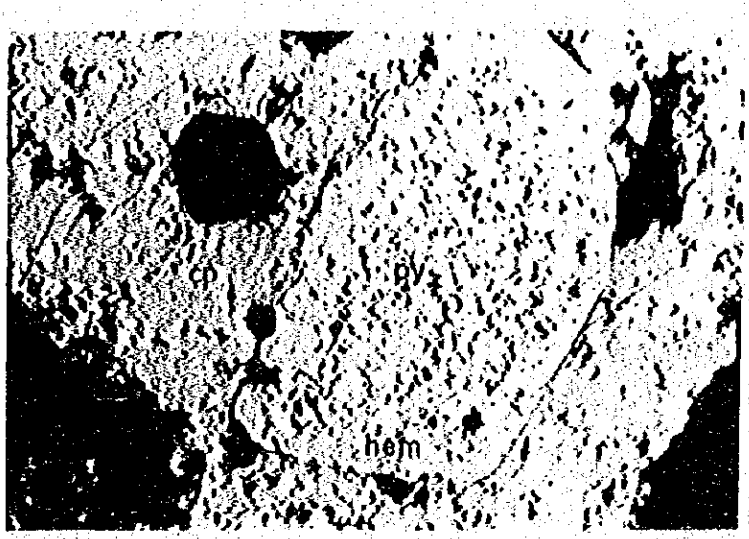
Sample No. 354

Rock name
Quartz monzonite porphyry

Location
DDH 4. 177.3m

cp : Chalcopyrite

Scale 0.5 mm



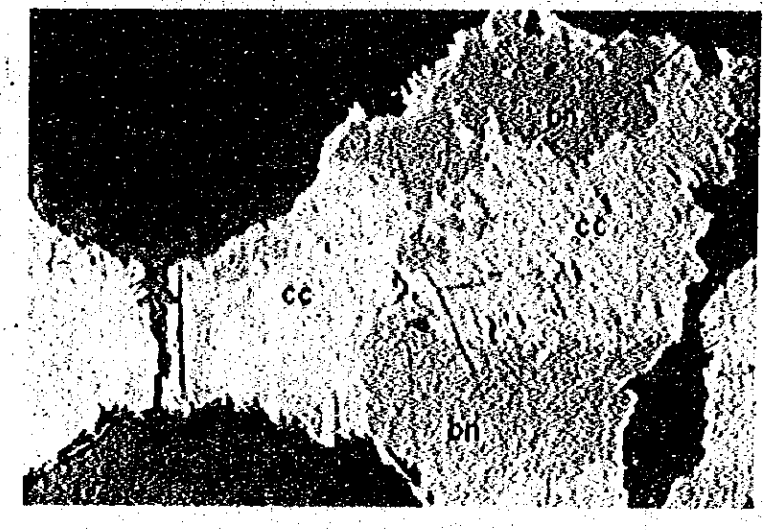
Sample No. 358

Rock name
Quartz monzonite porphyry

Location
DDH 4, 220.0m

cp : Chalcopyrite
py : Pyrite
hem : Hematite

Scale
0.5 mm



Sample No. 362

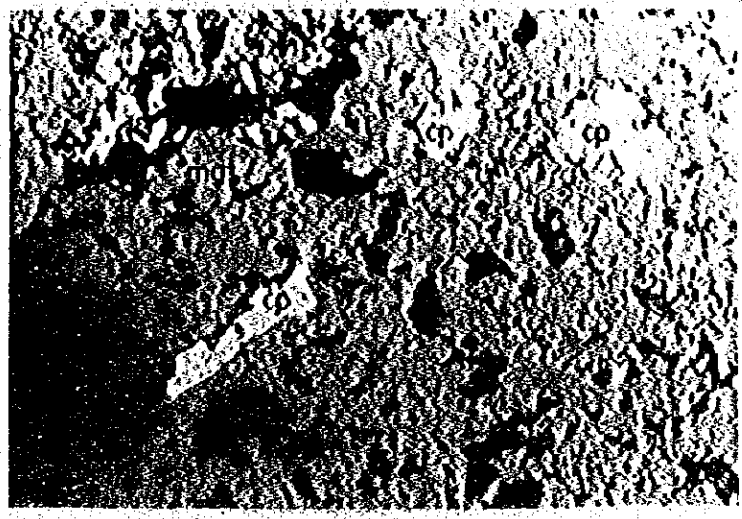
Rock name
Meta gabbro

Location
DDH 5, 67.3

bn : Bornite

cc : Chalcocite

Scale
0.5 mm



Sample No. 363

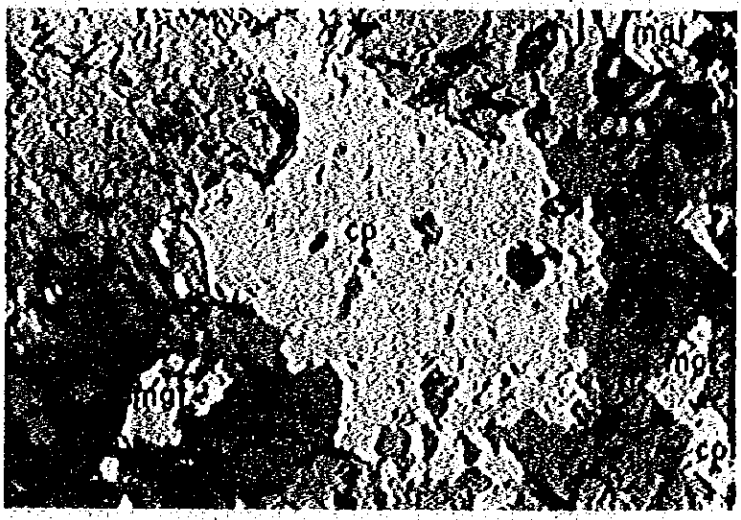
Rock name
Gabbro

Location
DDH 5, 84.5

cp : Chalcopyrite

mgt : Magnetite

Scale 0.5 mm



Sample No. 364

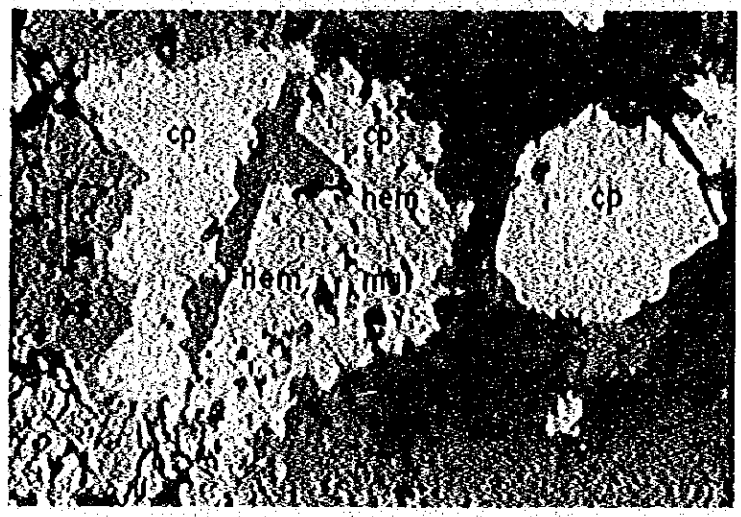
Rock name
Gabbro

Location
DDH 5, 98.5

cp : Chalcopyrite

mgt : Magnetite

Scale 0.5 mm



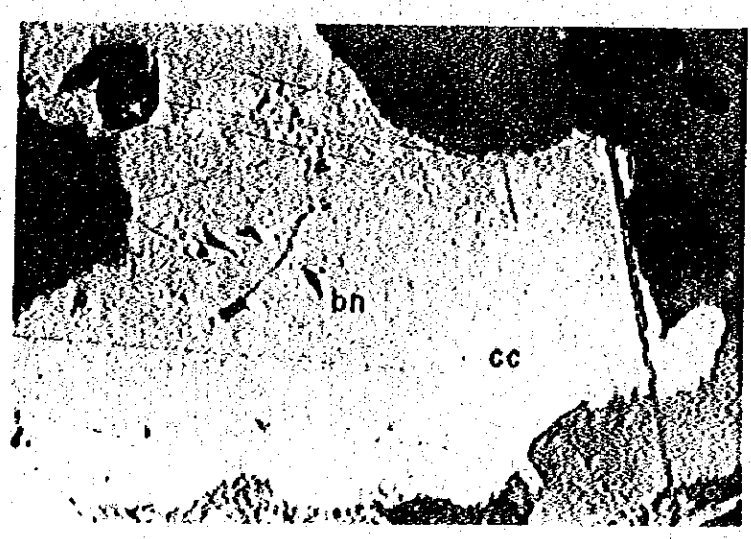
Sample No. 365

Rock name
Diorite

Location
DDH 5, 122.7m

cp : Chalcopyrite
hem : Hematite
mgt : Magnetite

Scale 0.5 mm



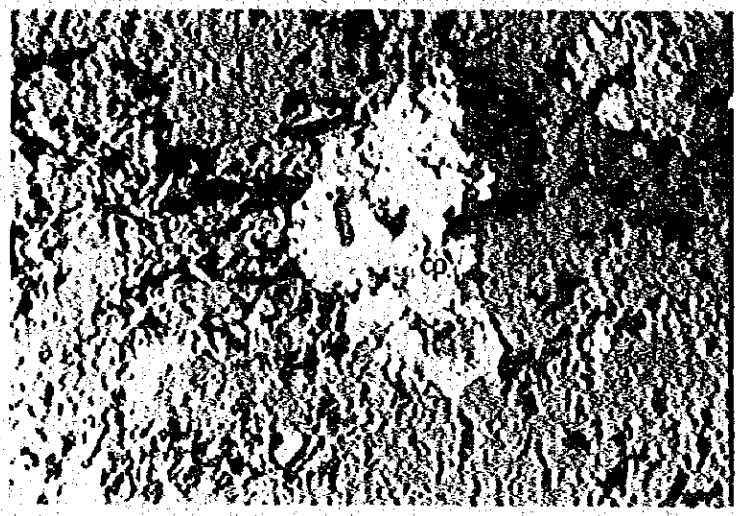
Sample No. 366

Rock name
Altered diorite

Location
DDH 5, 132.0m

bn : Bornite
cc : Chalcocite

Scale 0.5 mm



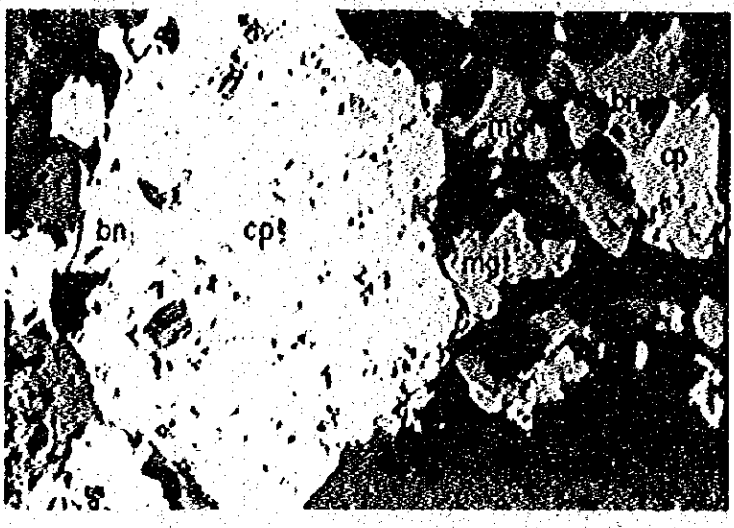
Sample No. 367

Rock name
Gabbro

Location
DDH 172.0m

cp : Chalcopyrite

Scale 0.5 mm



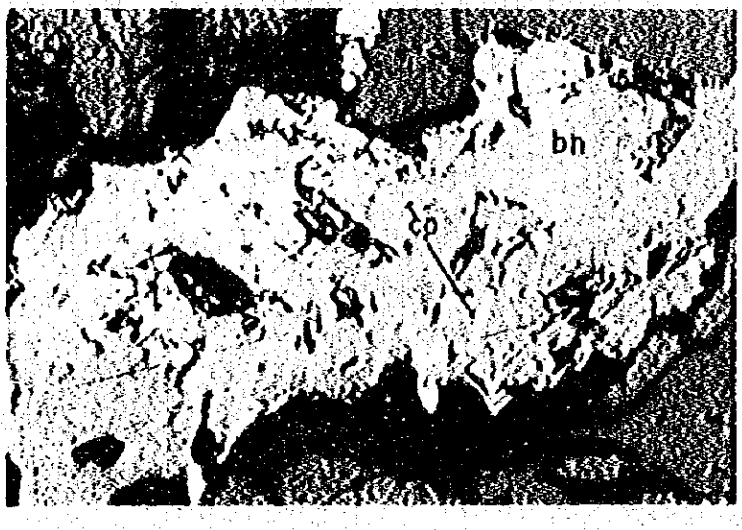
Sample No. 369

Rock name
Altered gabbro

Location
DDH 5, 188.9m

bn : Bornite
cp : Chalcopyrite
mgt : Magnetite

Scale 0.5 mm



Sample No. 373

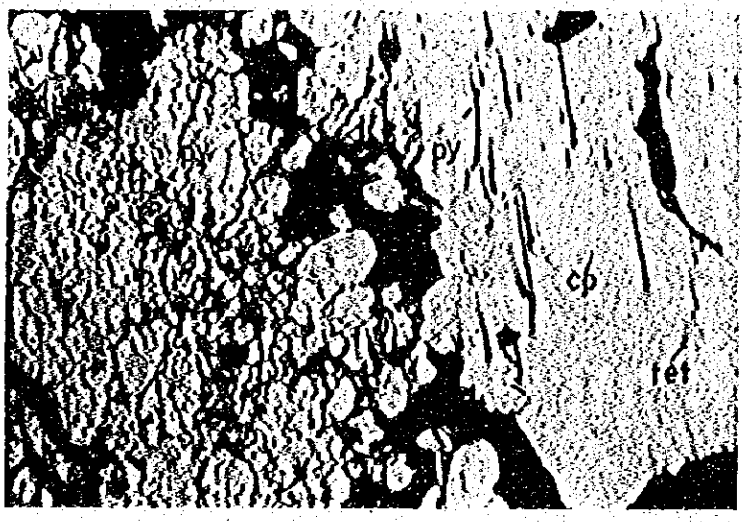
Rock name
Hornblende gabbro

Location
DDH 6. 31.0m

bn : Bornite

cp : Chalcopyrite

Scale 0.5 mm



Sample No. 374

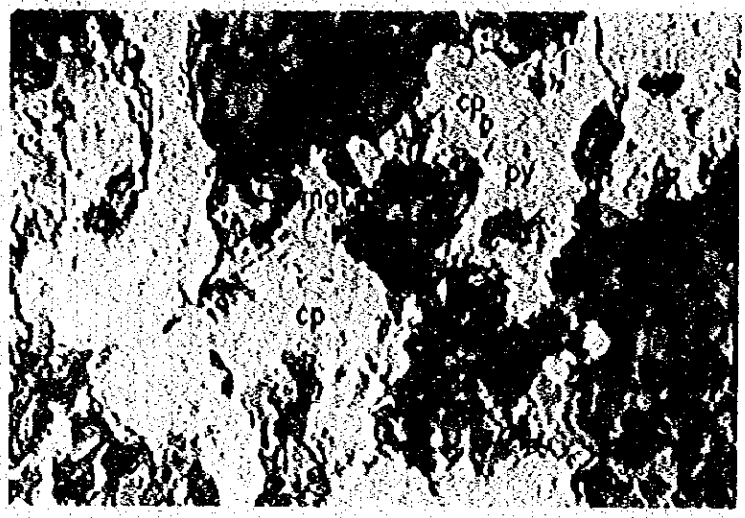
Rock name
Calcite vein

Location
DDH 6. 74.8m

cp : Chalcopyrite

tet : Tetrahedrite

Scale 0.5 mm



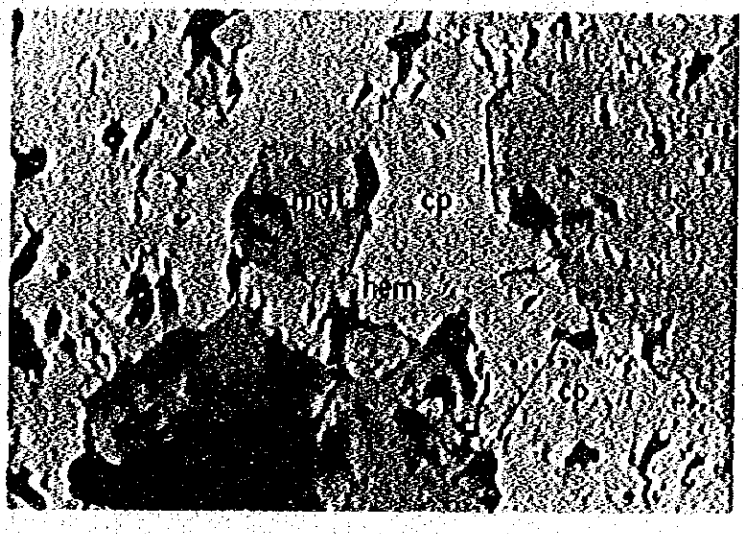
Sample No. 375

Rock name
Altered diorite

Location
DDH 6. 80.5m

cp : Chalcopyrite
py : Pyrite
mgt : Magnetite

Scale
0.5 mm



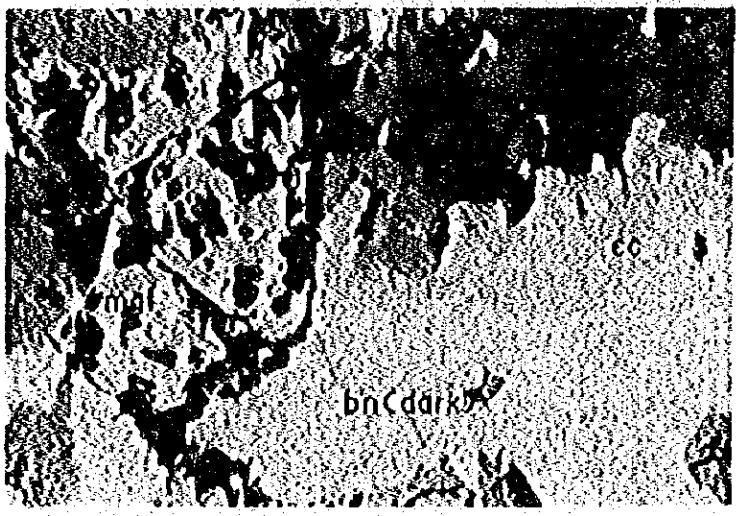
Sample No. 376

Rock name
Hornblende gabbro

Location
DDH 6. 93.3

cp : Chalcopyrite
mgt : Magnetite
hem : Hematite

Scale
0.5 mm



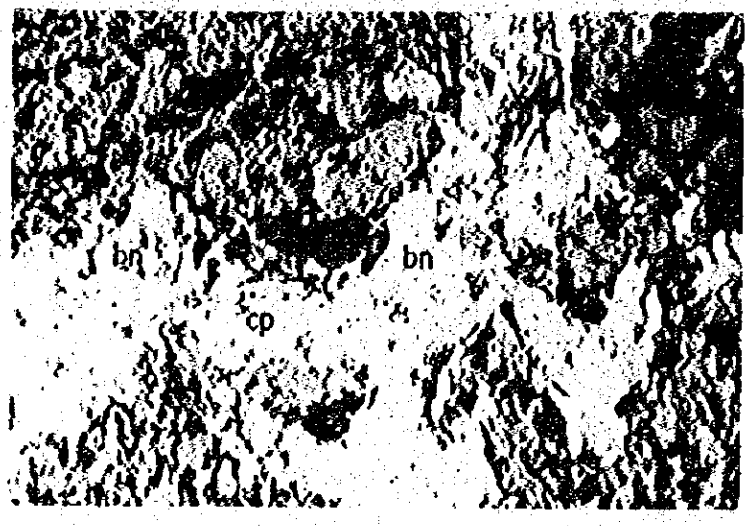
Sample No. 377

Rock name
Hornblende gabbro

Location
DDH 6. 97.0m

bn : Bornite
cc : Chalcocite
mgt : Magnetite

Scale 0.5 mm



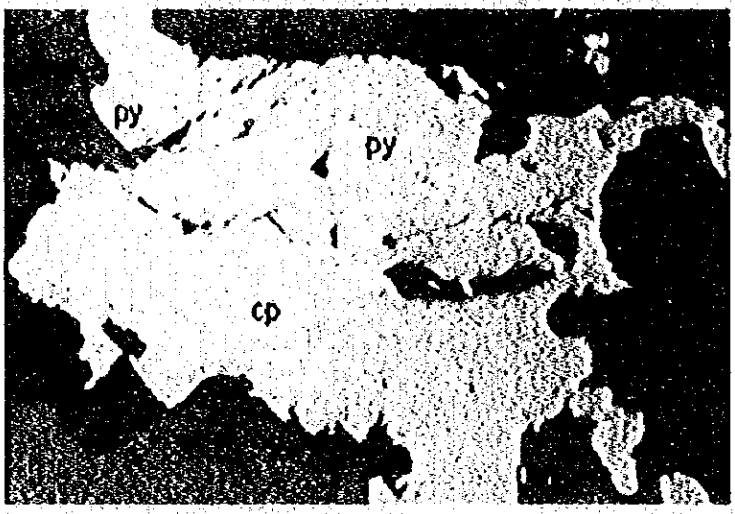
Sample No. 379

Rock name
Hornblende gabbro

Location
DDH 6. 114.4m

bn : Bornite
cp : Chalcopyrite

Scale 0.5 mm



Sample No. 381

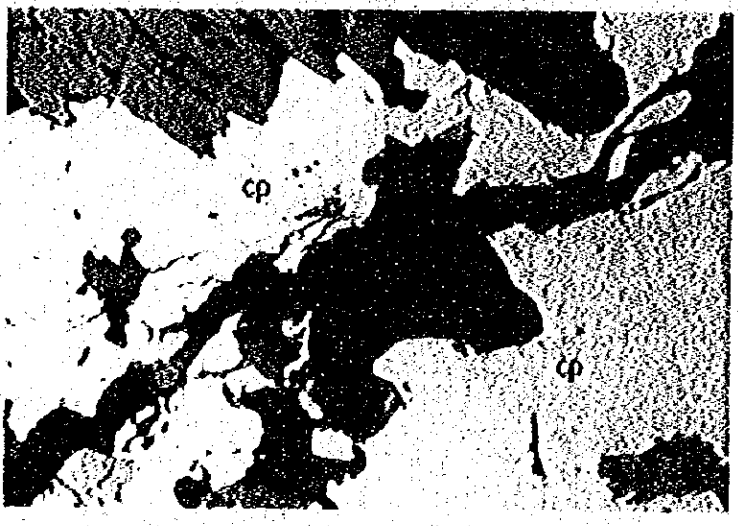
Rock name
Altered diorite

Location
DDH 6. 117.0m

cp : Chalcopyrite

py : Pyrite

Scale 0.5 mm



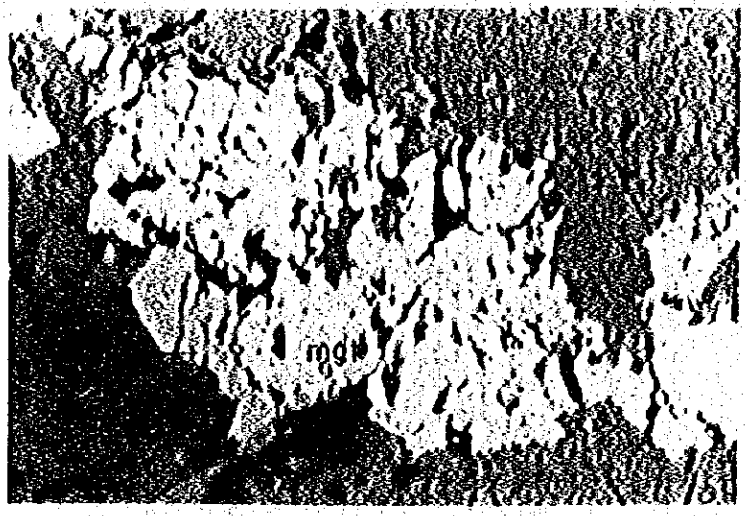
Sample No. 385

Rock name
Gabbro

Location
DDH 6. 234.0m

cp : Chalcopyrite

Scale 0.5 mm



Sample No. 388

Rock name
Hornblende gabbro

Location
DDH 6, 250.3

mgt : Magnetite

Scale 0.5 mm

Table I-12 chart of X-ray Diffractive Araiysis

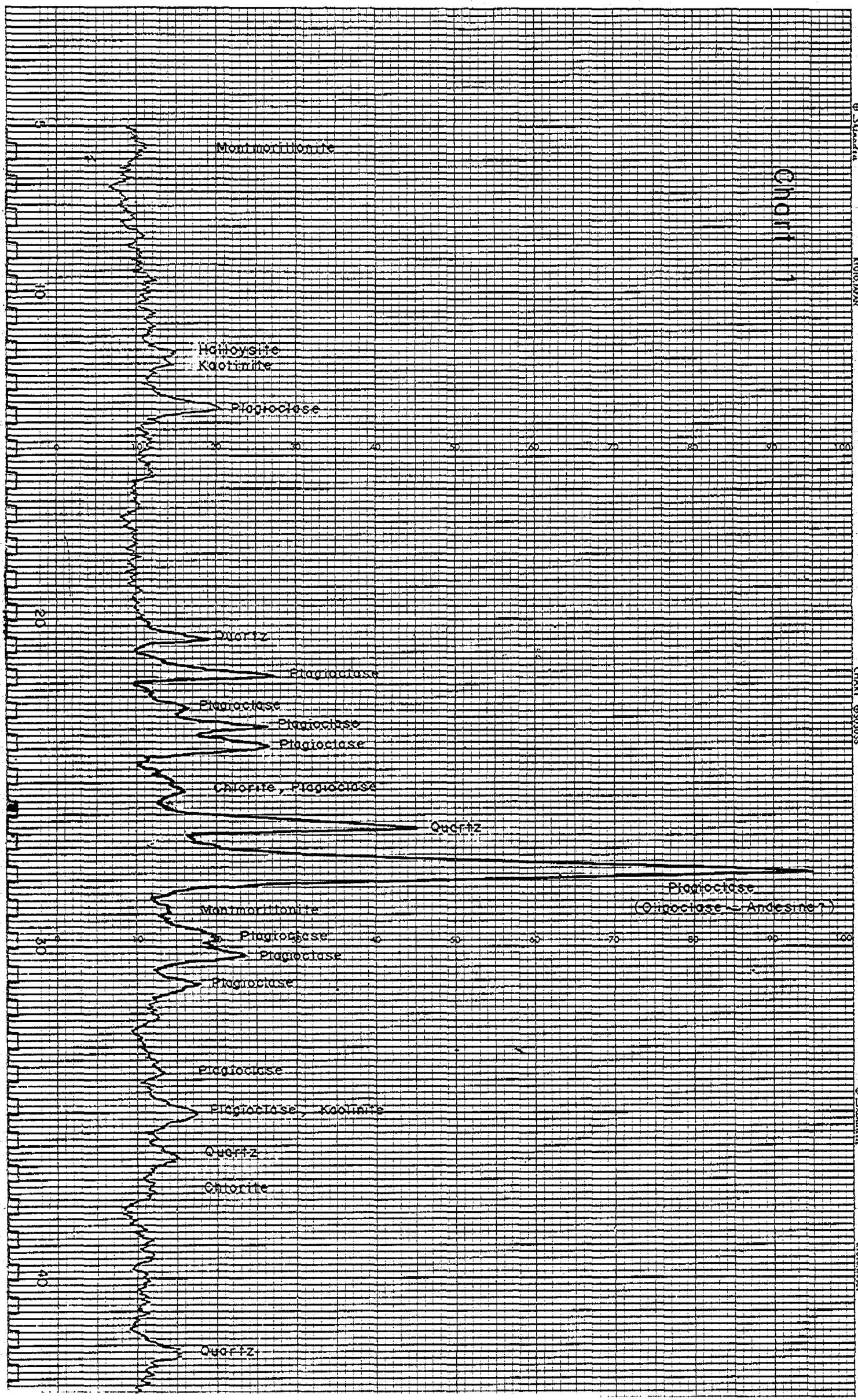


Chart 1
KYOTO JAPAN
CHART ⊕503033
Montmorillonite
Halloysite
Kaolinite
Plagioclase
Quartz
Plagioclase
Plagioclase
Plagioclase
Plagioclase
Chlorite, Plagioclase
Quartz
Plagioclase
(Oligoclase ~ Andesine?)
Montmorillonite
Plagioclase
Plagioclase
Plagioclase
Plagioclase
Plagioclase, Kaolinite
Quartz
Chlorite
Quartz
10
20
30
40
50
60
70
80
90
100

DIFRACTOMETER (SHIMAZU-VD-1)
Sample No. 306
Target: Cu. 30Kv. 15mA Filter: Ni
Slits: Div. 1.0mm. Rec.1.0mm. Scat. 0.5mm
Time const: 2 sec. Full scale: 500 cps
Speed: 4-4cm/min. 1°/cm
Date: March 1974
Note: DDH-1 75.5m
Altered porphyritic granodiorite

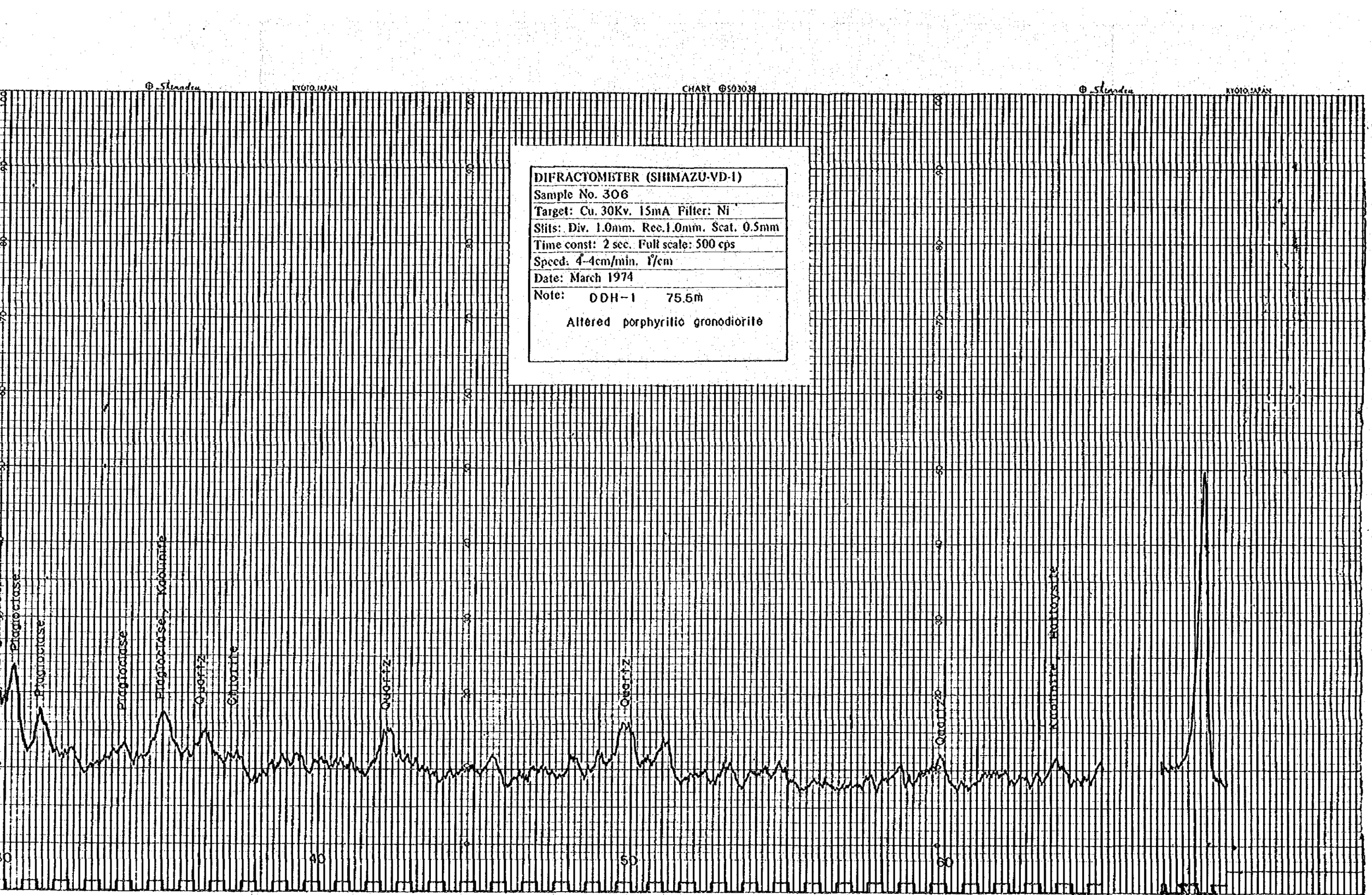


CHART ⊕S03038 ⊕ Shimadzu KYOTO JAPAN CHART ⊕S03038

Chart 2

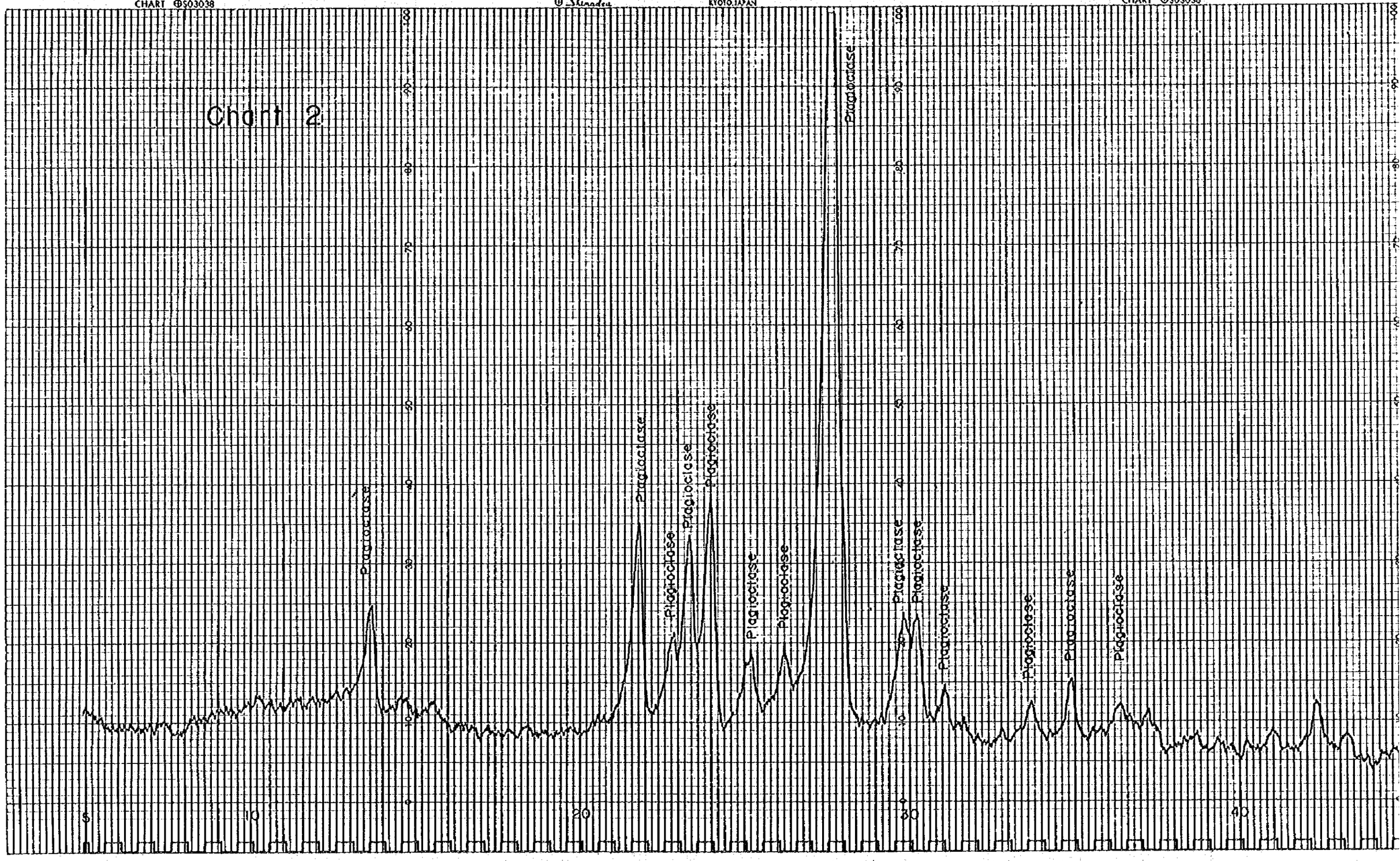


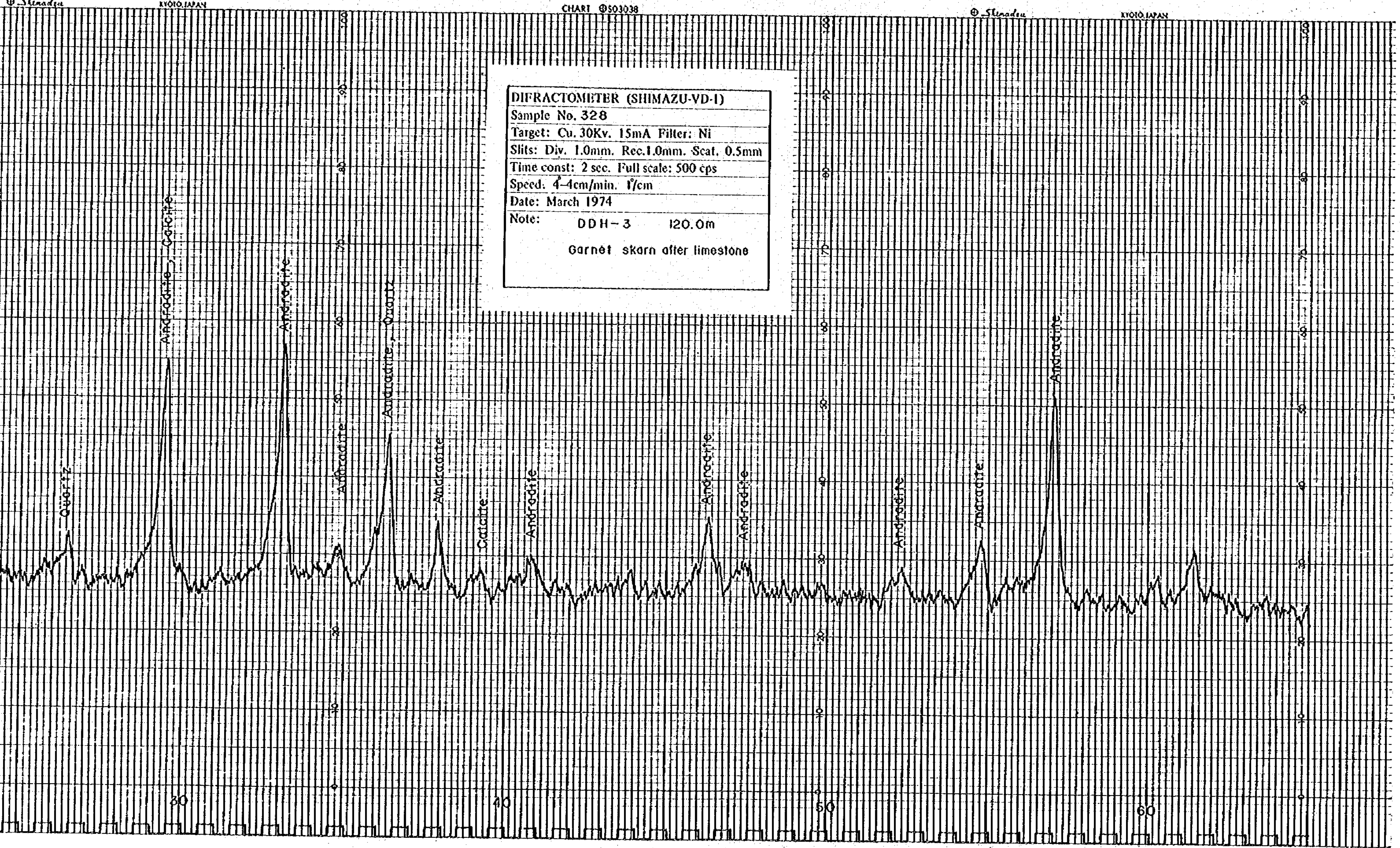
CHART ⊕S03038 ⊕ Shimadzu KYOTO JAPAN CHART ⊕S03038

DIFRACTOMETER (SHIMAZU-VD-1)
Sample No. 313
Target: Cu. 30Kv. 15mA Filter: Ni
Slits: Div. 1.0mm. Rec.1.0mm. Scat. 0.5mm
Time const: 2 sec. Full scale: 500 cps
Speed: 4°-4cm/min. 1°/cm
Date: March 1974
Note: DDH-2 60.5m
Salic phenocrysts of porphyritic granodiorite

CHART ⊕S03038 ⊕ Shimadzu KYOTO JAPAN CHART ⊕S03038

Chart 3

DIFRACTOMETER (SHIMA
Sample No. 328
Target: Cu. 30Kv. 15mA Fi
Slits: Div. 1.0mm. Rec.1.0m
Time const: 2 sec. Full scale:
Speed: 4-4cm/min. 1°/cm
Date: March 1974
Note: DDH-3
Garnet skarn o



DIFRACTOMETER (SHIMAZU-VD-1)
Sample No. 328
Target: Cu. 30Kv. 15mA Filter: Ni
Slits: Div. 1.0mm. Rec.1.0mm. Scat. 0.5mm
Time const: 2 sec. Full scale: 500 cps
Speed: 4°-4cm/min. 1°/cm
Date: March 1974
Note: DDH-3 120.0m
Garnet skarn after limestone
Quartz
Andradite , Calcite
Andradite
Andradite
Andradite , Quartz
Andradite
Calcite
Andradite
Andradite
Andradite
Andradite
Andradite
Andradite
30
40
50
60
CHART ⊕503038
KYOTO, JAPAN

KYOTO, JAPAN CHART ⊕S03038 ⊕ Shimadzu KYOTO, JAPAN

Chart 4

DIFRACTOMETE
Sample No. 340
Target: Cu. 30Kv
Slits: Div. 1.0mm
Time const: 2 sec
Speed: 4-4cm/mi
Date: March 197
Note: DD

Altered
porphyry

DIFRACTOMETER (SHIMAZU-VD-1)
Sample No. 340
Target: Cu. 30Kv. 15mA Filter: Ni
Slits: Div. 1.0mm. Rec.1.0mm. Scat. 0.5mm
Time const: 2 sec. Full scale: 500 cps
Speed. 4-4cm/min. 1°/cm
Date: March 1974
Note: ODH – 4 10.0m
Altered quartz monzonite porphyry (mainly silicified)

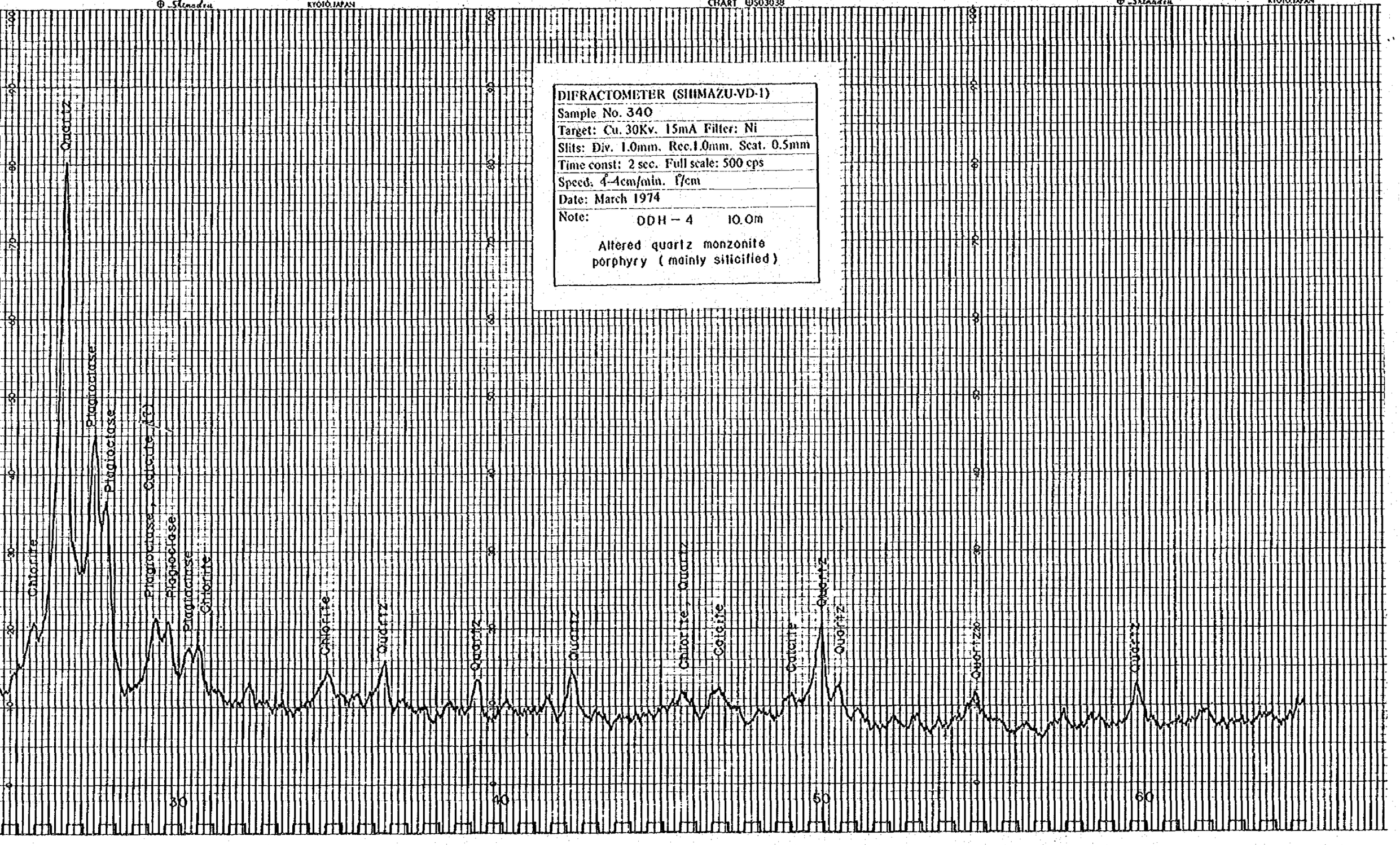


Chart 8


Plagioclase
Quartz
Plagioclase
Plagioclase
Plagioclase
Plagioclase
Plagioclase, Calcite
Plagioclase
Plagioclase
Quartz
Plagioclase
Quartz
5
10
20
30
40

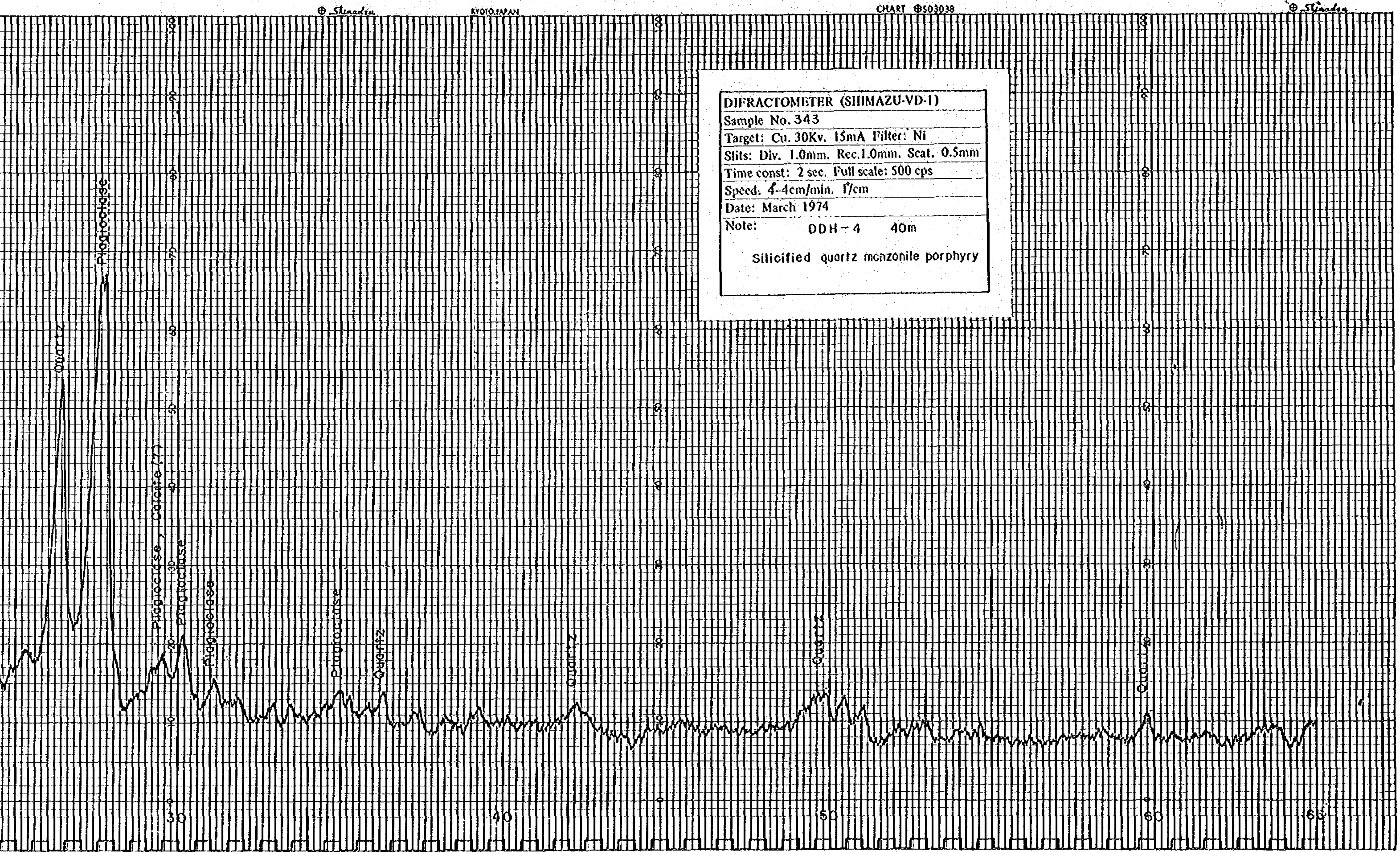
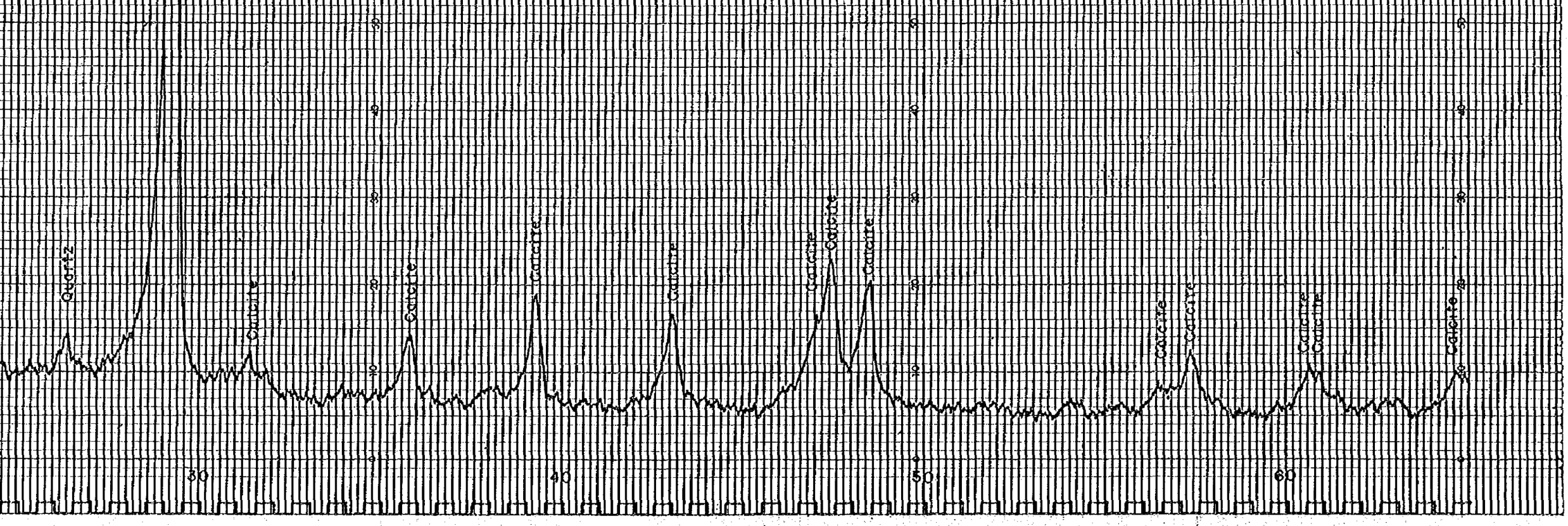

Shimadzu
KYOTO JAPAN
CHART 503038
DIFRACTOMETER (SHIMAZU-VD-1)
Sample No. 343
Target: Cu. 30Kv. 15mA Filter: Ni
Slits: Div. 1.0mm. Rec.1.0mm. Scat. 0.5mm
Time const: 2 sec. Full scale: 500 cps
Speed: 4-4cm/min. 1°/cm
Date: March 1974
Note: DDH-4 40m
Silicified quartz monzonite porphyry
Quartz
Plagioclase
Plagioclase, Calcite (?)
Plagioclase
Plagioclase
Plagioclase
Quartz
Quartz
Quartz
Quartz
30
40
50
60
66

Chart 6

DIFRACTOMETER (SHIMA
Sample No. 345
Target: Cu. 30Kv. 15mA Fi
Slits: Div. 1.0mm. Rec.1.0n
Time const: 2 sec. Full scale
Speed: 4-4cm/min. 1°/cm
Date: March 1974
Note: DDH-4
"Post-ore" Carbonate ve
ore-quartz veinlets in qu
porphyry

CHART ⊕S03038 ⊕ Shimadzu KYOTO JAPAN CHART ⊕S03038

DIFRACTOMETER (SHIMAZU-VD-1)
Sample No. 345
Target: Cu. 30Kv. 15mA Filter: Ni
Slits: Div. 1.0mm. Rec.1.0mm. Scat. 0.5mm
Time const: 2 sec. Full scale: 500 cps
Speed. 4-4cm/min. 1°/cm
Date: March 1974
Note: ODH-4 53.2m
"Post-ore" Carbonate vein cutting ore-quartz veinlets in quartz monzonite porphyry



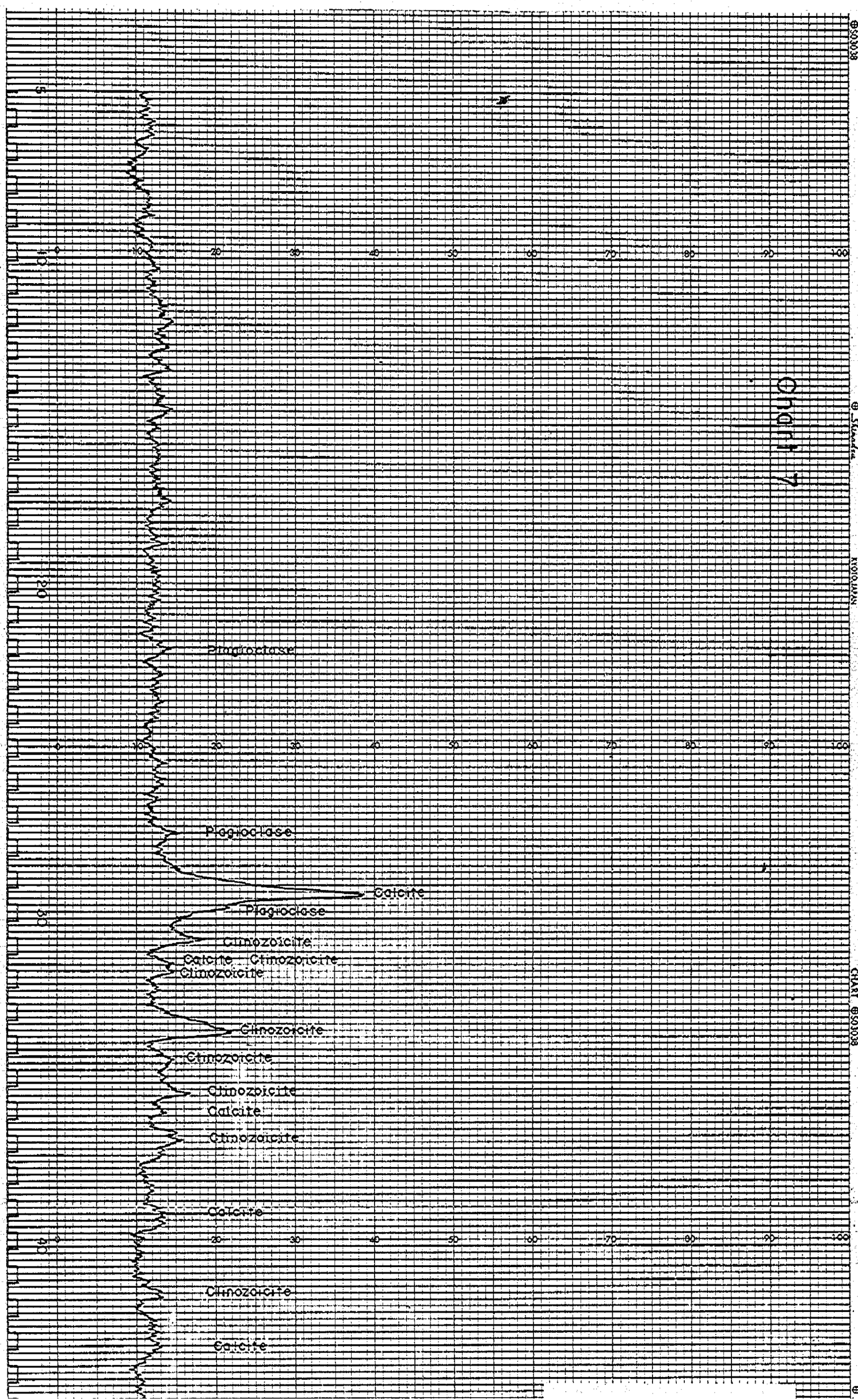


Chart 7
Plagioclase
Plagioclase
Calcite
Plagioclase
Clinozoicite
Calcite Clinozoicite
Clinozoicite
Clinozoicite
Clinozoicite
Clinozoicite
Calcite
Clinozoicite
Calcite
Clinozoicite
Calcite
CHART ⊕S03038
⊕S03038
⊕ Standard
KYOTO JAPAN

CHART ⊕S03038 ⊕ Shimadzu KYOTO JAPAN CHART ⊕S03038

DIFRACTOMETER (SHIMAZU-VD-I)
Sample No. 356
Target: Cu. 30Kv. 15mA Filter: Ni
Slits: Div. 1.0mm. Rec.1.0mm. Scat. 0.5mm
Time const: 2 sec. Full scale: 500 cps
Speed. 4-4cm/min. 1°/cm
Date: March 1974
Note: DDH-4 140m Altered quartz monzonite porphyry (propylitic alteration)

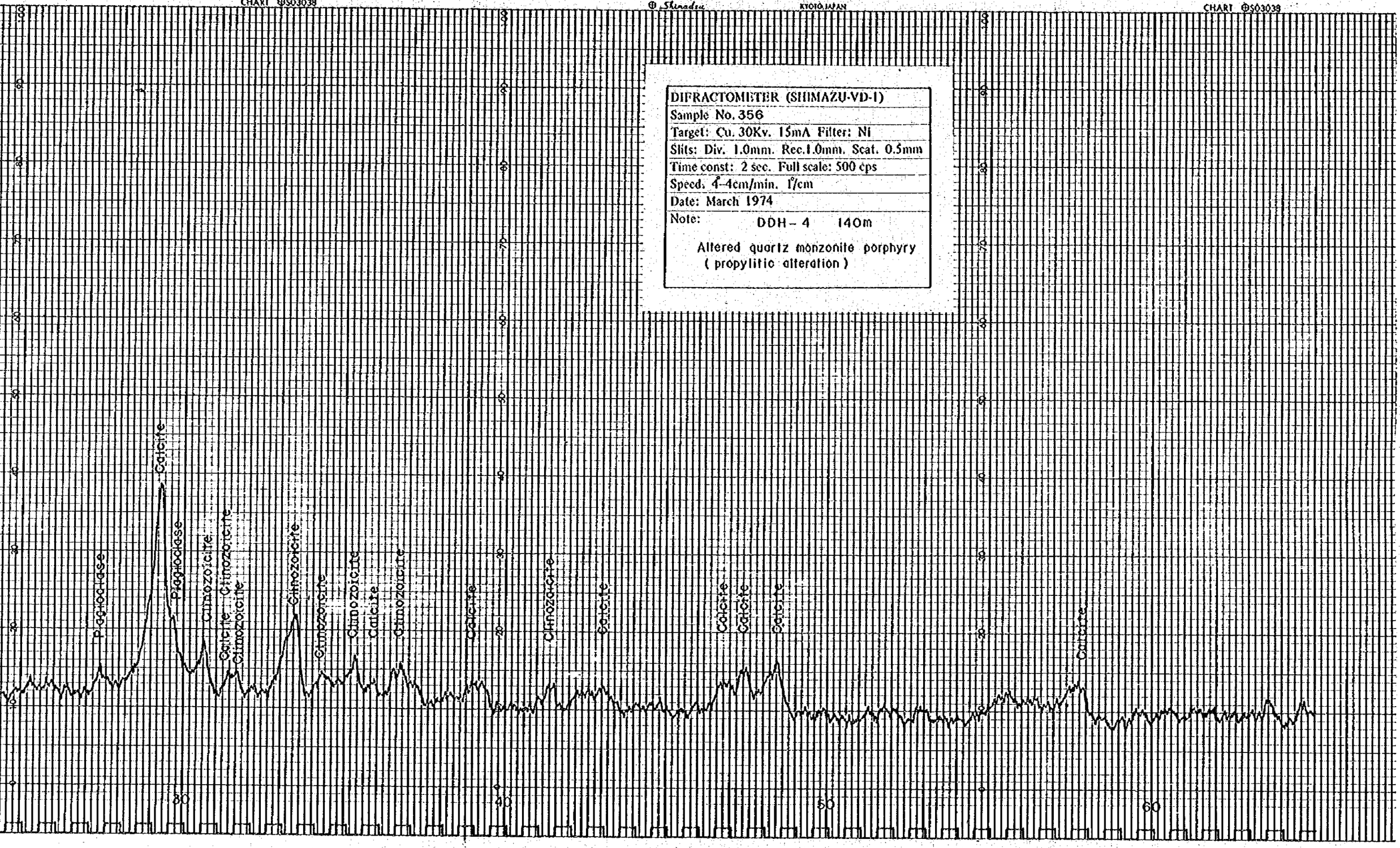


CHART ⊕S03038 ⊕ Shinadzu KYOTO JAPAN CHART ⊕S03038

Chart 18

DIFRACTOMETER (SHIMAZU-VD-1)
Sample No. 361
Target: Cu. 30Kv. 15mA Filter: Ni
Slits: Div. 1.0mm. Rec.1.0mm. Scat. 0.5mm
Time const: 2 sec. Full scale: 500 cps
Speed. 4°-4cm/min. 1°/cm
Date: March 1974
Note: DDH-5 45.6m Clay-quartz veinlet in altered gabbroid rock

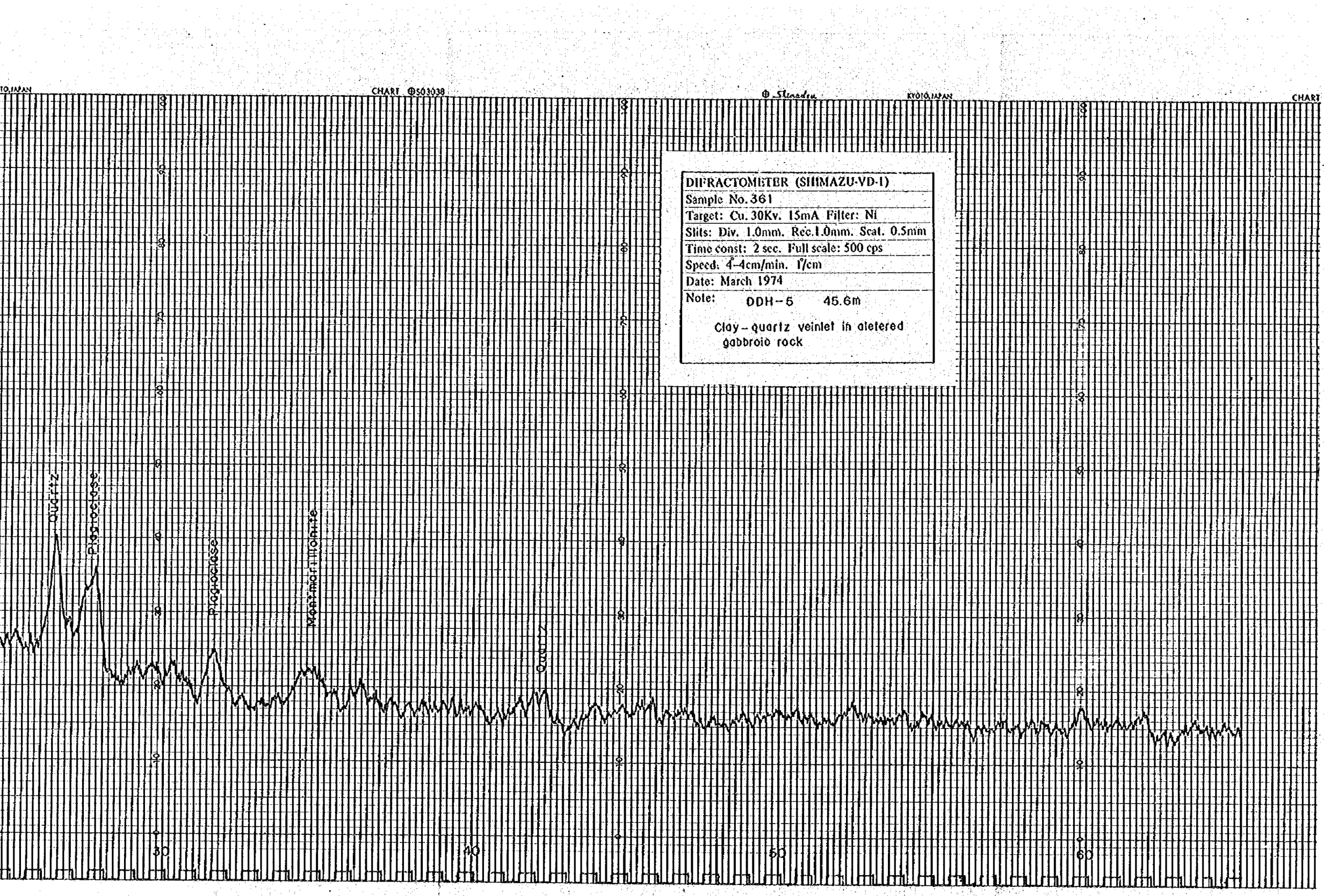


CHART ⊕503038 ⊕ Shimadzu KYOTO,JAPAN CHART ⊕503038

Chart 9

DIFRACTOMETER (SHIM.
Sample No. 364
Target: Cu. 30Kv. 15mA
Slits: Div. 1.0mm. Rec.1.0
Time const: 2 sec. Full scal
Speed: 4-4cm/min. 1°/cm
Date: March 1974
Note: DDH-5
Skarnized gabb
(rich in green

Shimadzu KYOTO, JAPAN CHART ⊕S03038 ⊕ Shimadzu KYOTO, JAPAN

DIFRACTOMETER (SHIMAZU-VD-1)
Sample No. 364
Target: Cu. 30Kv. 15mA Filter: Ni
Slits: Div. 1.0mm. Rec.1.0mm. Scat. 0.5mm
Time const: 2 sec. Full scale: 500 cps
Speed. 4°-4cm/min. 1°/cm
Date: March 1974
Note: DDH-5 98.6m Skarnized gabbroic rock (rich in green skarn)

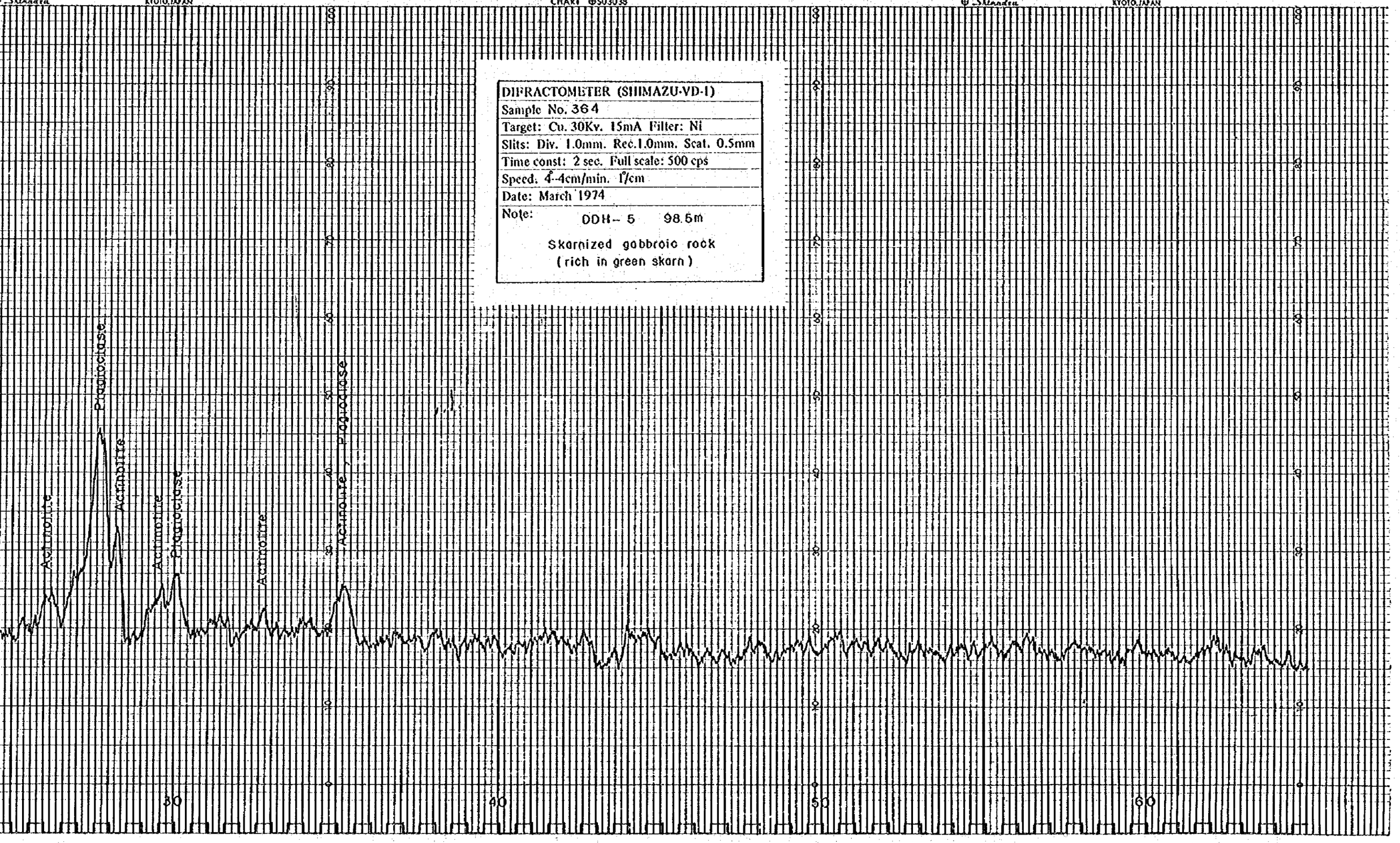


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Chart 10

DIFRACTOMI
Sample No. 3€
Target: Cu. 30
Slits: Div. 1.0
Time const: 2
Speed: 4–4cm/
Date: March 1
Note: D
Carbonat
gabbroic

Pleurochrysis carterae
Calcite
Pleurochrysis carterae
Pleurochrysis carterae
Calcite
Pleurochrysis carterae
Calcite
Pleurochrysis carterae
Calcite
Calcite

5 10 20 30 40

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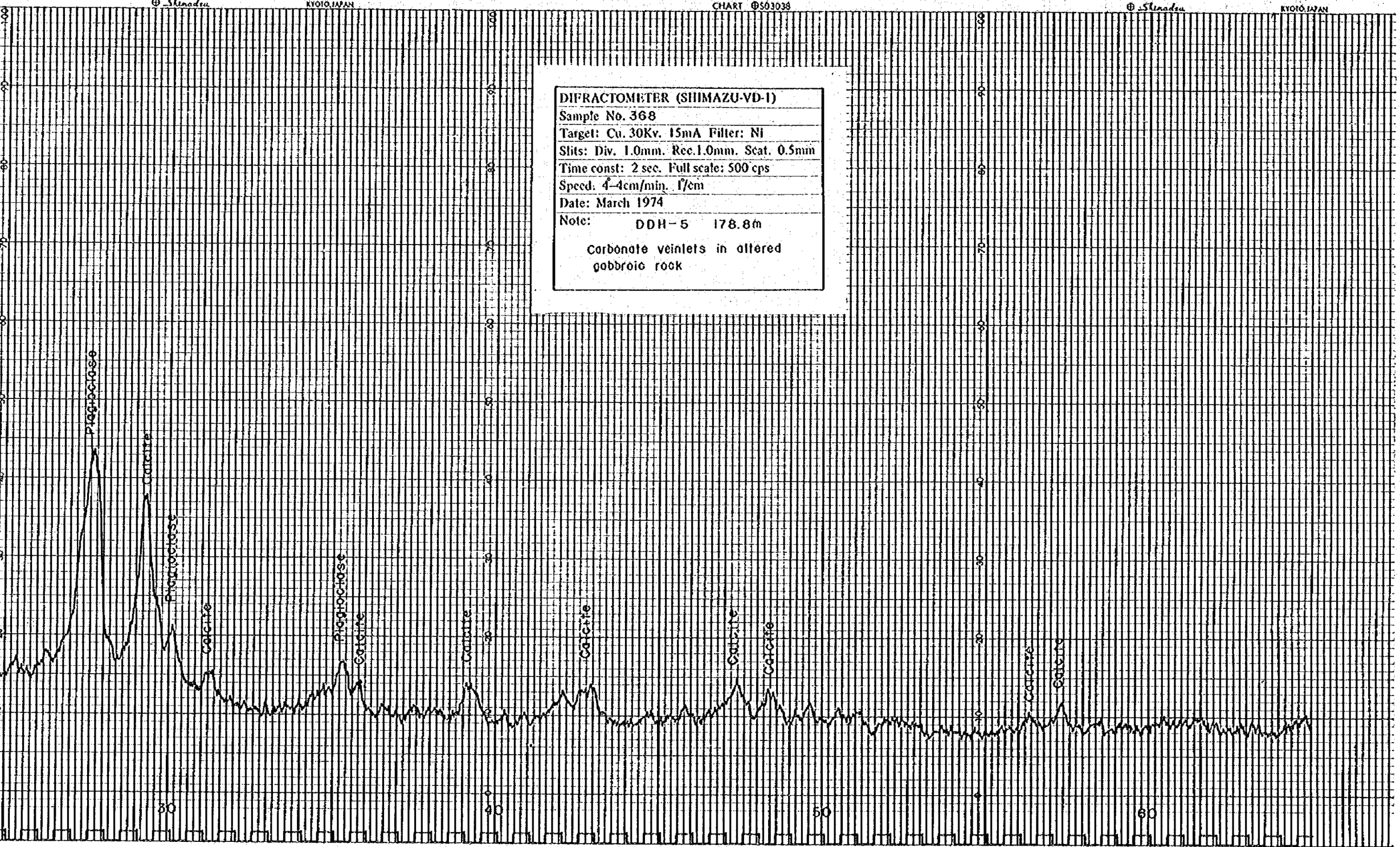
DIFRACTOMETER (SHIMAZU-VD-1)
Sample No. 368
Target: Cu. 30Kv. 15mA Filter: Ni
Slits: Div. 1.0mm. Rec.1.0mm. Scat. 0.5mm
Time const: 2 sec. Full scale: 500 cps
Speed. 4°–4cm/min. 1°/cm
Date: March 1974
Note: DDH–5 178.8m Carbonate veinlets in altered gabbroic rock



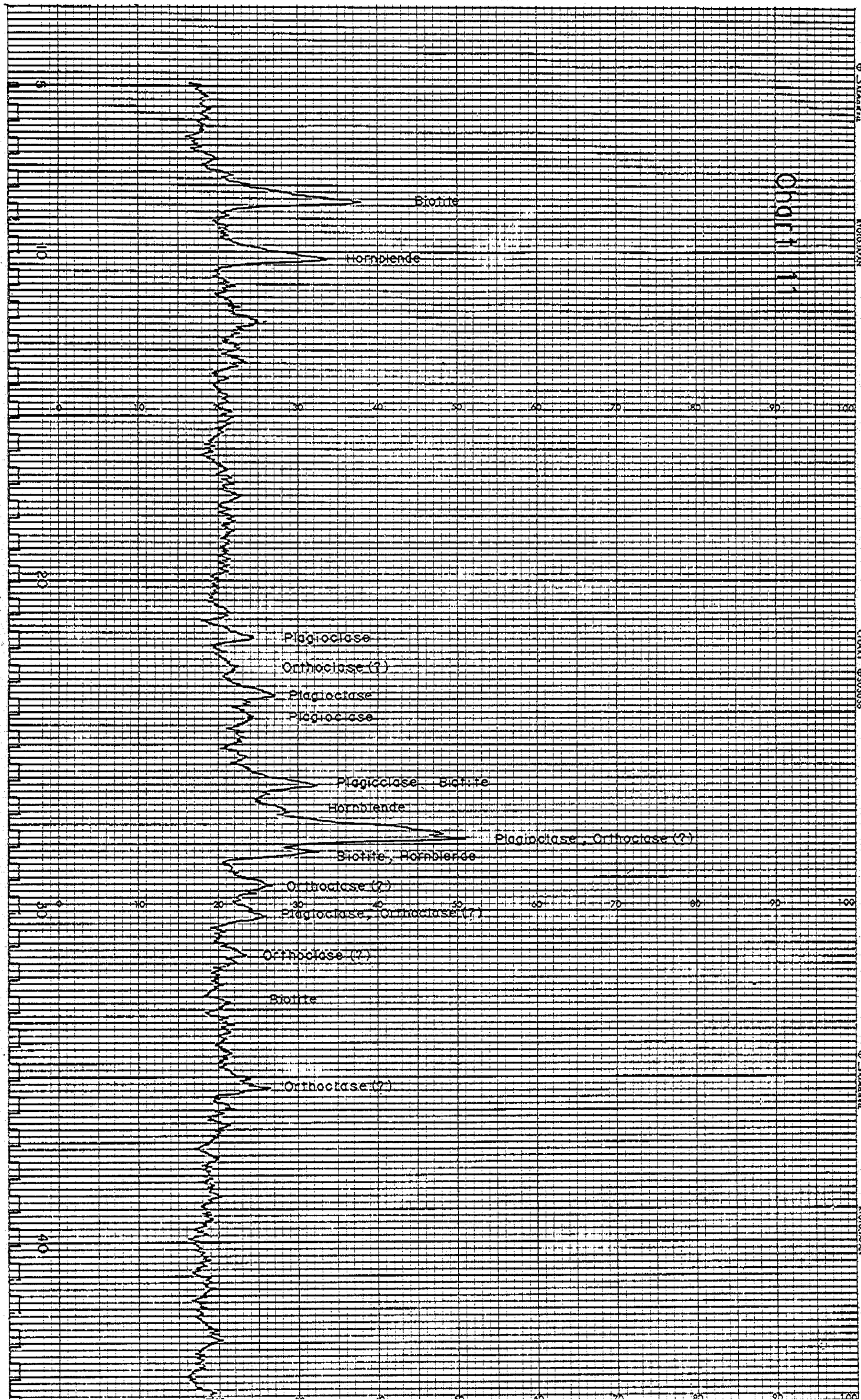
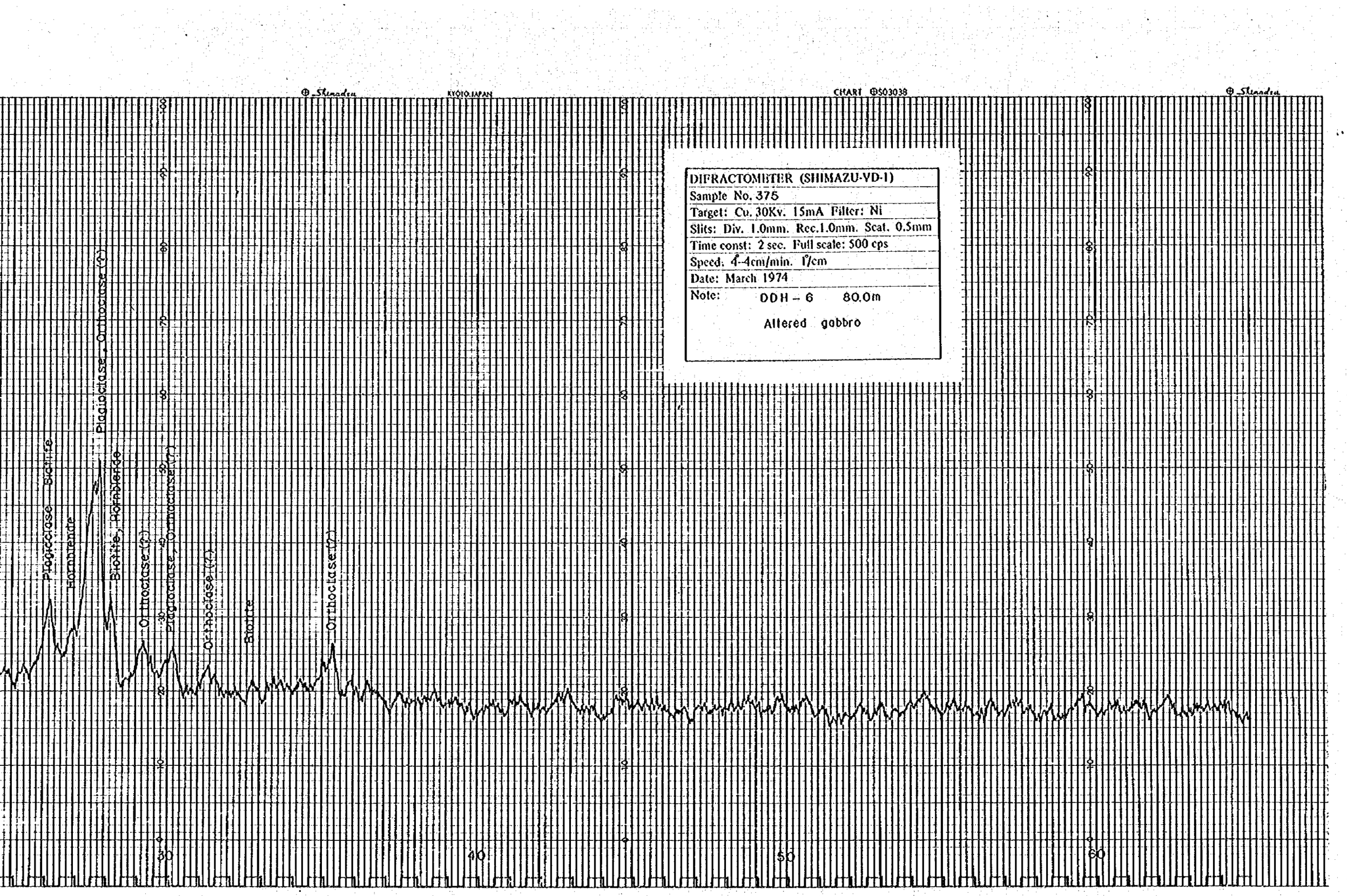


Chart 11
KYOTO, JAPAN
CHART ⊕S03038
Biotite
Hornblende
Plagioclase
Orthoclase (?)
Plagioclase
Plagioclase
Plagioclase, Biotite
Hornblende
Plagioclase, Orthoclase (?)
Biotite, Hornblende
Orthoclase (?)
Plagioclase, Orthoclase (?)
Orthoclase (?)
Biotite
Orthoclase (?)
0
10
20
30
40
50
60
70
80
90
100

DIFRACTOMETER (SHIMAZU-VD-1)
Sample No. 375
Target: Cu. 30Kv. 15mA Filter: Ni
Slits: Div. 1.0mm. Rec.1.0mm. Scat. 0.5mm
Time const: 2 sec. Full scale: 500 cps
Speed. 4-4cm/min. 1°/cm
Date: March 1974
Note: DDH – 6 80.0m
Altered gabbro



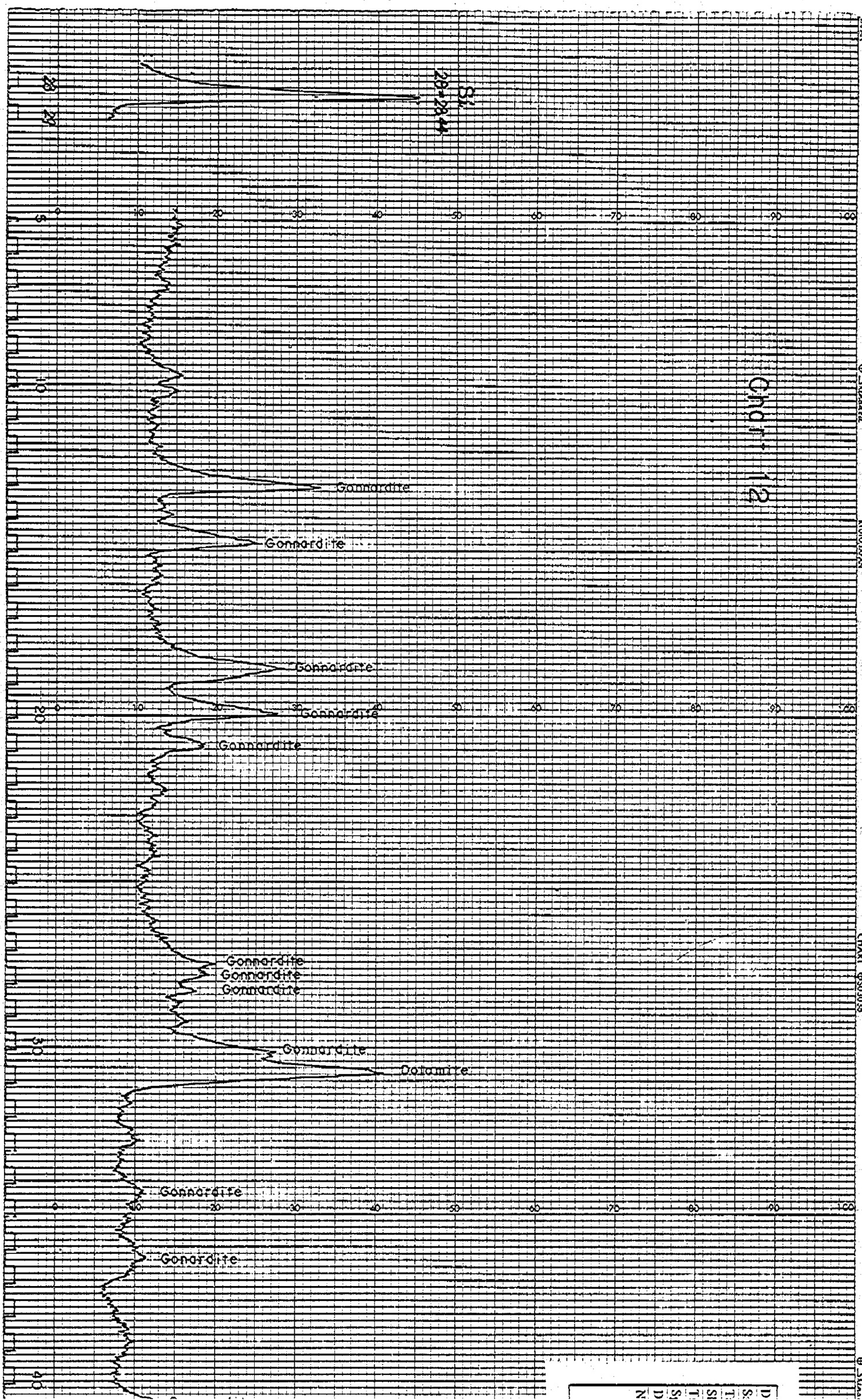
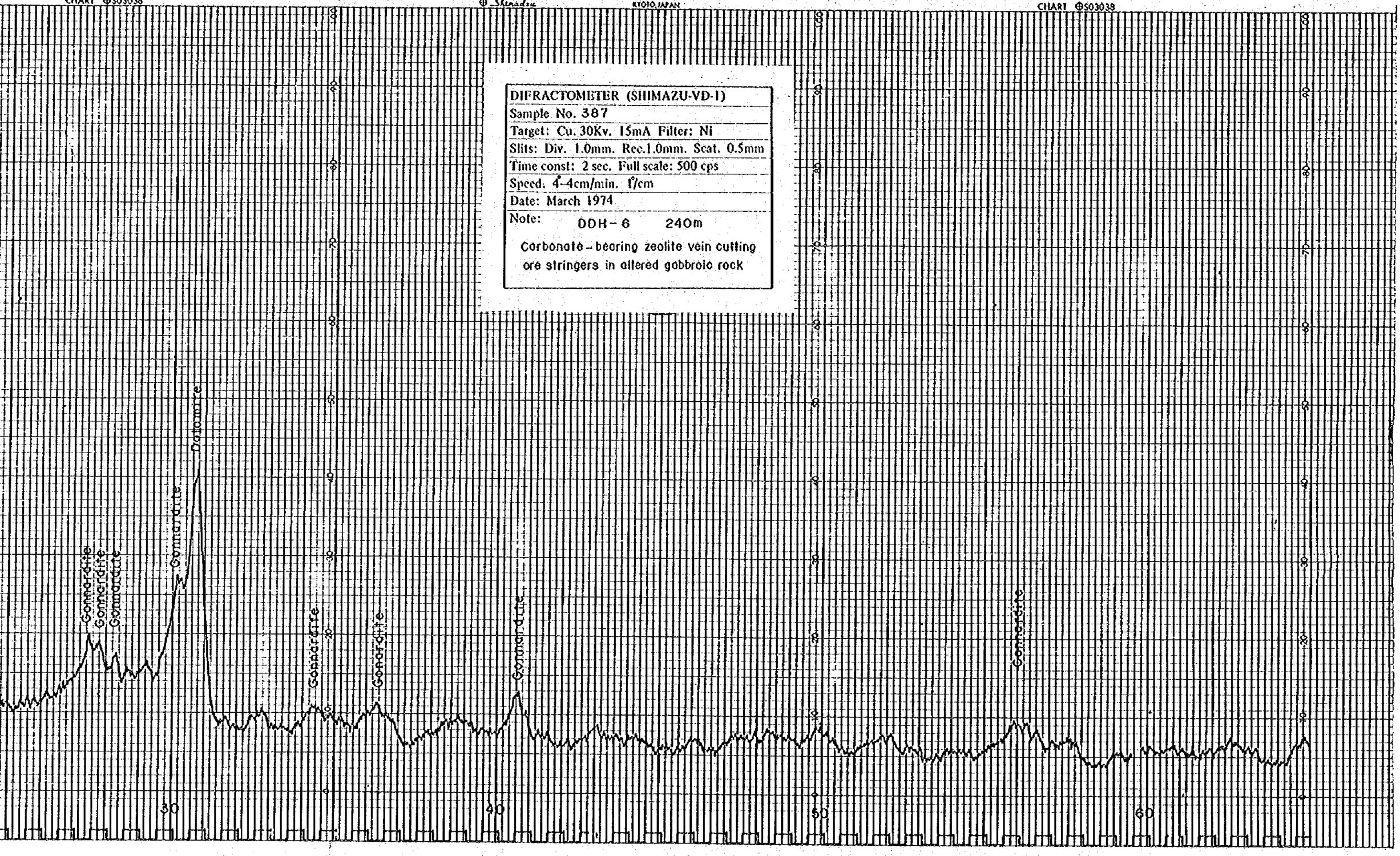


Chart 12
Gonnardite
Gonnardite
Gonnardite
Gonnardite
Gonnardite
Gonnardite
Gonnardite
Gonnardite
Gonnardite
Dolomite
Gonnardite
Gonnardite
Si
2θ=28.4°
JAPAN
KYOTO JAPAN
CHART #503038

CHART ⊕S03038 ⊕-Shimadzu KYOTO JAPAN CHART ⊕S03038

DIFRACTOMETER (SHIMAZU-VD-1)
Sample No. 387
Target: Cu. 30Kv. 15mA Filter: Ni
Slits: Div. 1.0mm. Rec.1.0mm. Scat. 0.5mm
Time const: 2 sec. Full scale: 500 cps
Speed: 4°-4cm/min. 1°/cm
Date: March 1974
Note: DDH-6 240m Carbonate-bearing zeolite vein cutting ore stringers in altered gabbroic rock



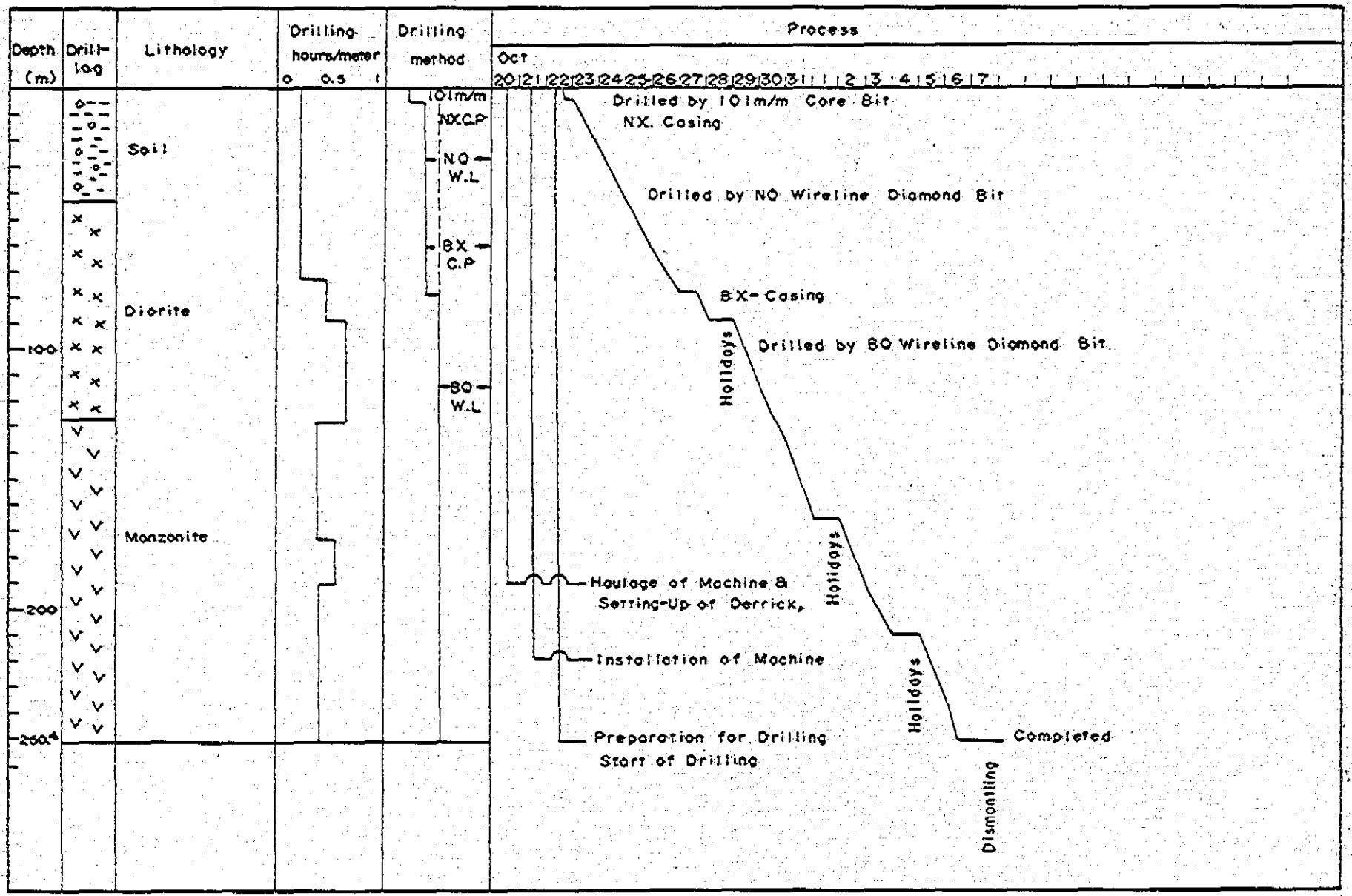
APPENDICES
(DRILLING DATA)

ANNEX 1 SPECIFICATIONS DIAMOND BITS REAMING SHELLS

ITEM	SIZE	TYPE	No.	DRILL HOLES DDH-1	DDH-2	DDH-3	DDH-4	DDH-5	DDH-6	TOTAL
Metal Bit	101 m/m		10	4.50 m	m	m	m	m	m	4.50 m
	"		11			6.30				6.30
	"		12		22.50					22.50
	"		16				6.00			6.00
	"		20					7.50		7.50
	"		30						6.50	6.50
Diamond Bit	NX-WL	NQ-WL	585						31.20	31.20
	"	"	592					54.30	0.70	55.00
	"	"	651						58.60	58.60
	"	"	710						42.20	42.20
	"	"	711						23.80	23.80
	"	"	5265			42.50				42.50
	"	"	5266			58.20		2.90		61.10
	"	"	5267	45.50						45.50
	"	"	5269					40.30		40.30
	"	"	5271				39.50			39.50
	"	"	5272				1.20			1.20
	"	"	5273		47.50					47.50
	"	"	5294	4.00			32.30			36.30
	"	"	6268	24.00						24.00
	BX-WL	BQ-WL	606					59.10		59.10
	"	"	609		5.10					5.10
	"	"	610					37.50		37.50
	"	"	618					27.60		27.60
	"	"	620					21.90		21.90
	"	"	1920		8.40					8.40
	"	"	2227		2.00					2.00
	"	"	2228		0.70					0.70
	"	"	2254		6.90					6.90
	"	"	2580		2.60					2.60
	"	"	3278	21.60	8.20					29.80
	"	"	3450						27.60	27.60
	"	"	3451						60.50	60.50
	"	"	5500		2.30					2.30
	"	"	5503	38.25						38.25
	"	"	5505	36.70						36.70
	"	"	5507		28.60					28.60
	"	"	5508		2.00					2.00
	"	"	5510				47.00			47.00
	"	"	5512		11.30					11.30
	"	"	5513	13.75						13.75
	"	"	5514		0.50	111.60				112.10
	"	"	5515		17.00					17.00

ITEM	SIZE	TYPE	No.	DRILL HOLES						TOTAL
				DDH-1	DDH-2	DDH-3	DDH-4	DDH-5	DDH-6	
Diamond Bit	BX-WL	BQ-WL	5516	m	3.20 m	m	m	m	m	3.20 m
	"	"	5517				43.90			43.90
	"	"	5518		26.70					26.70
	"	"	5520		17.90					17.90
	"	"	5275		15.50					15.50
	"	"	5277		2.20					2.20
	"	"	5279				44.40			44.40
	"	"	5283	62.10						62.10
	"	"	5284		6.20					6.20
	"	"	5285			31.60				31.60
	"	"	5286		13.20		36.00			49.20
	Total		$(M6)_{54}$	250.40	250.50	250.20	250.30	251.10	251.10	1503.60
Metal Reamer			14	4.50	22.50					27.00
			15			6.30	6.00			12.30
			25					7.50		7.50
			28						6.50	6.50
Diamond Reamer	NX-WL	NQ	260	73.50						73.50
	"	"	331						90.50	90.50
	"	"	410						66.00	66.00
	"	"	1331					97.50		97.50
	"	"	5261			100.70	73.00			173.70
	"	"	5262		47.50					47.50
	BX-WL	BQ	502	172.40						172.40
	"	"	508						88.10	88.10
	"	"	5288		180.50	143.20				323.70
	"	"	6600				171.30			171.30
	"	"	6601					131.70		131.70
	"	"	6625					14.40		14.40
	Total		$(M4)_{16}$	250.40	250.50	250.20	250.30	251.10	251.10	1503.60

ANNEX 2 TABLE SHOWING DRILLING PROGRESS (DDH.-1)



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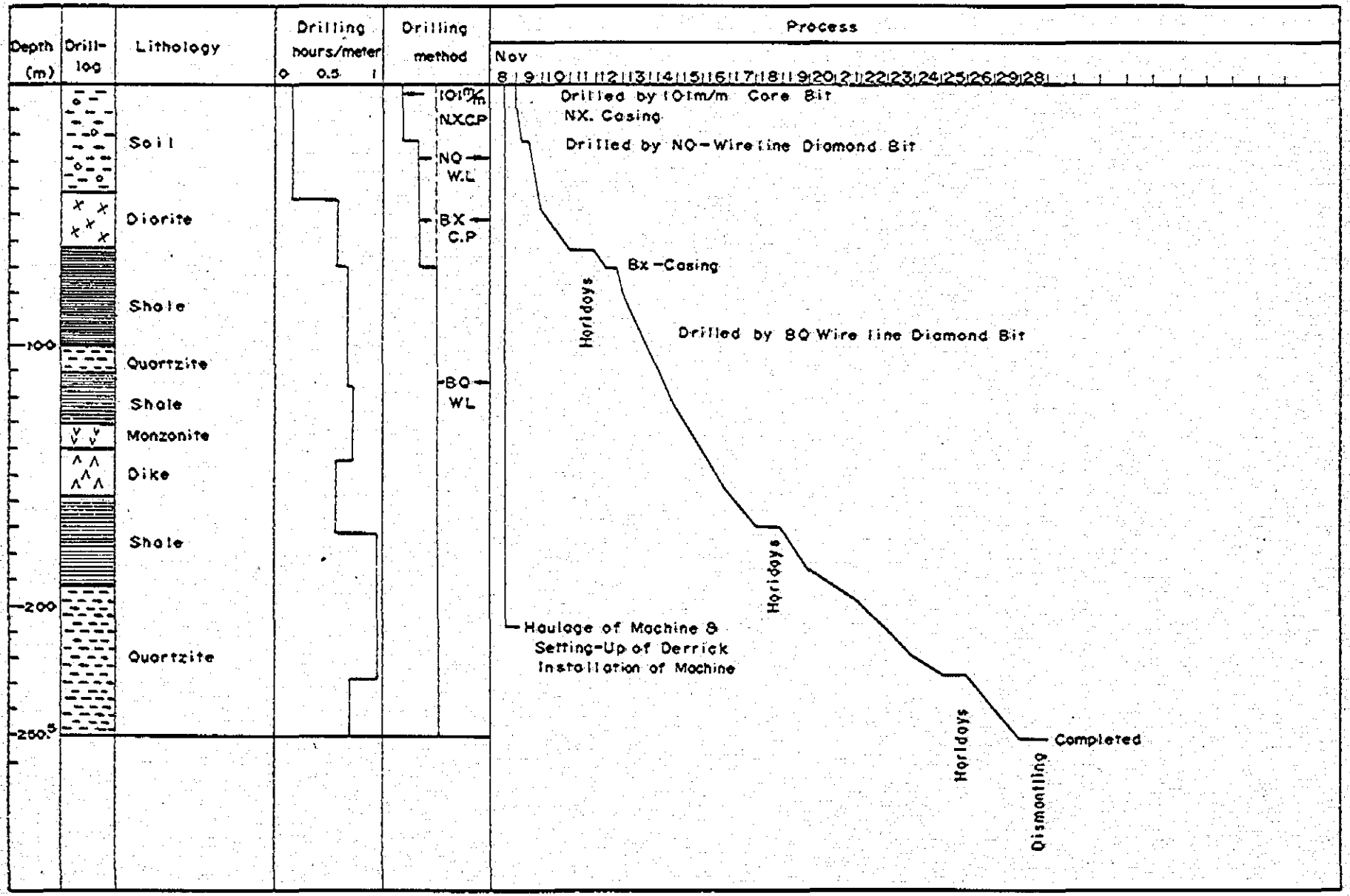
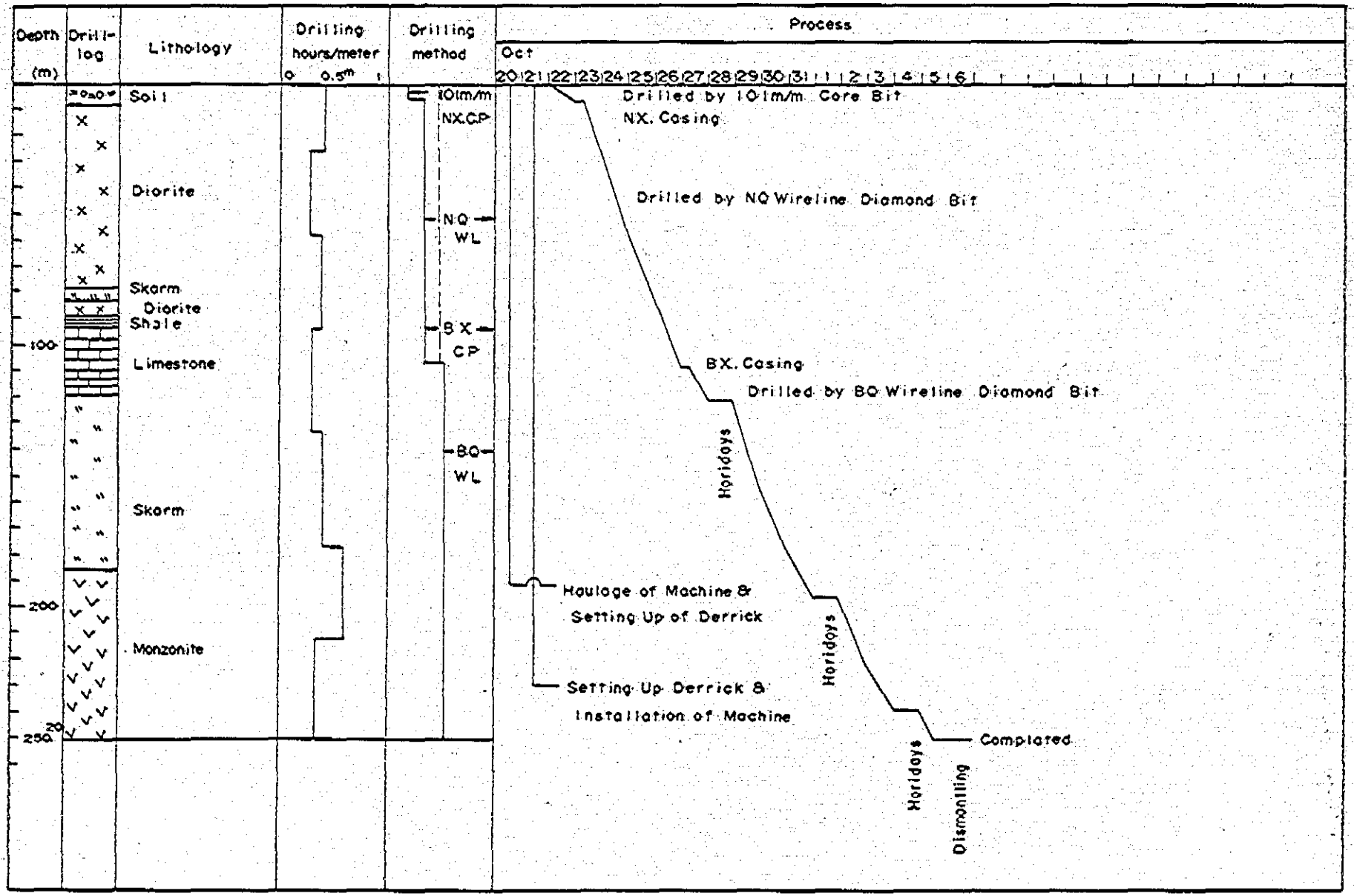
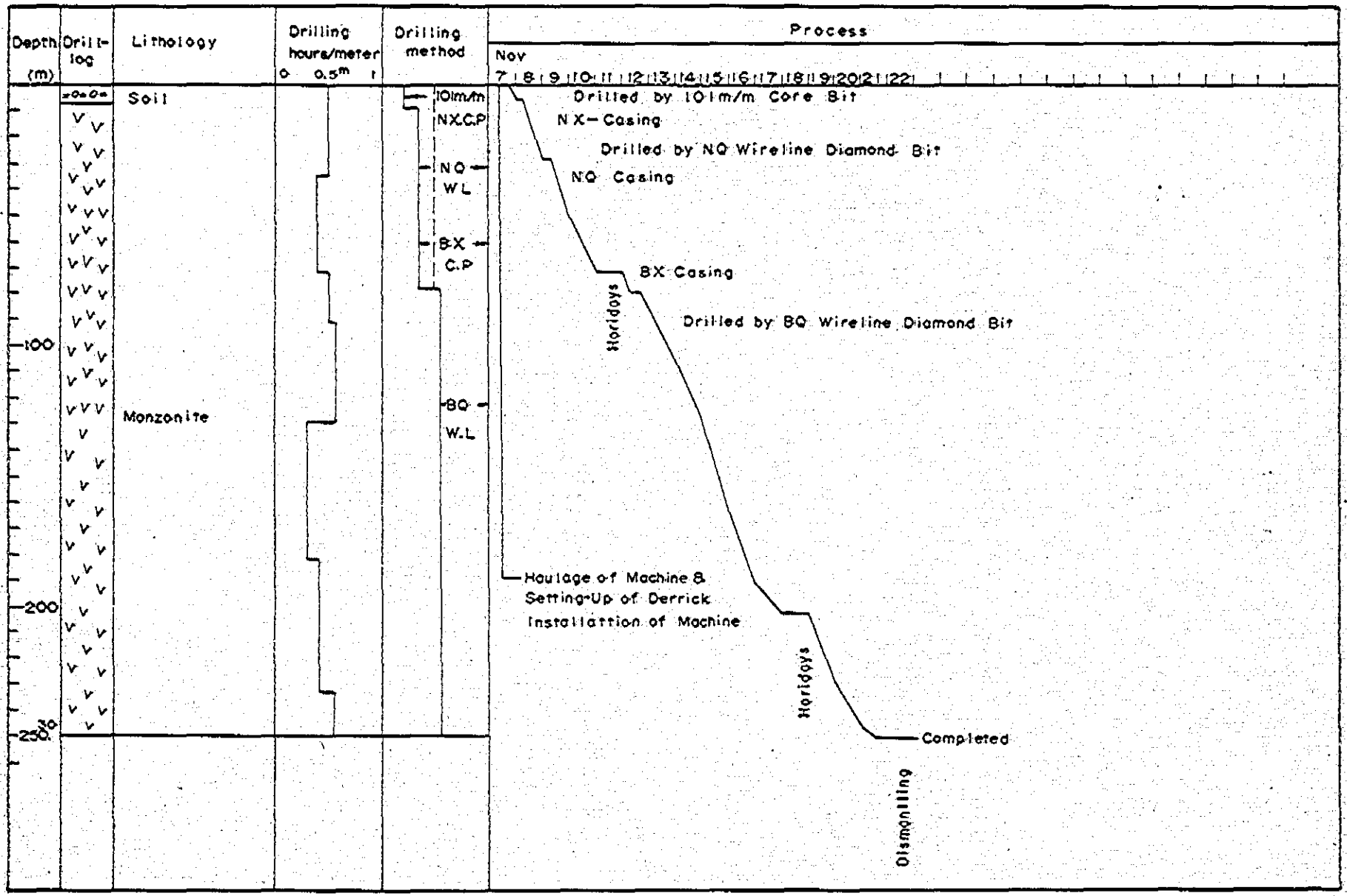
ANNEX 3 TABLE SHOWING DRILLING PROGRESS (DDH-2)



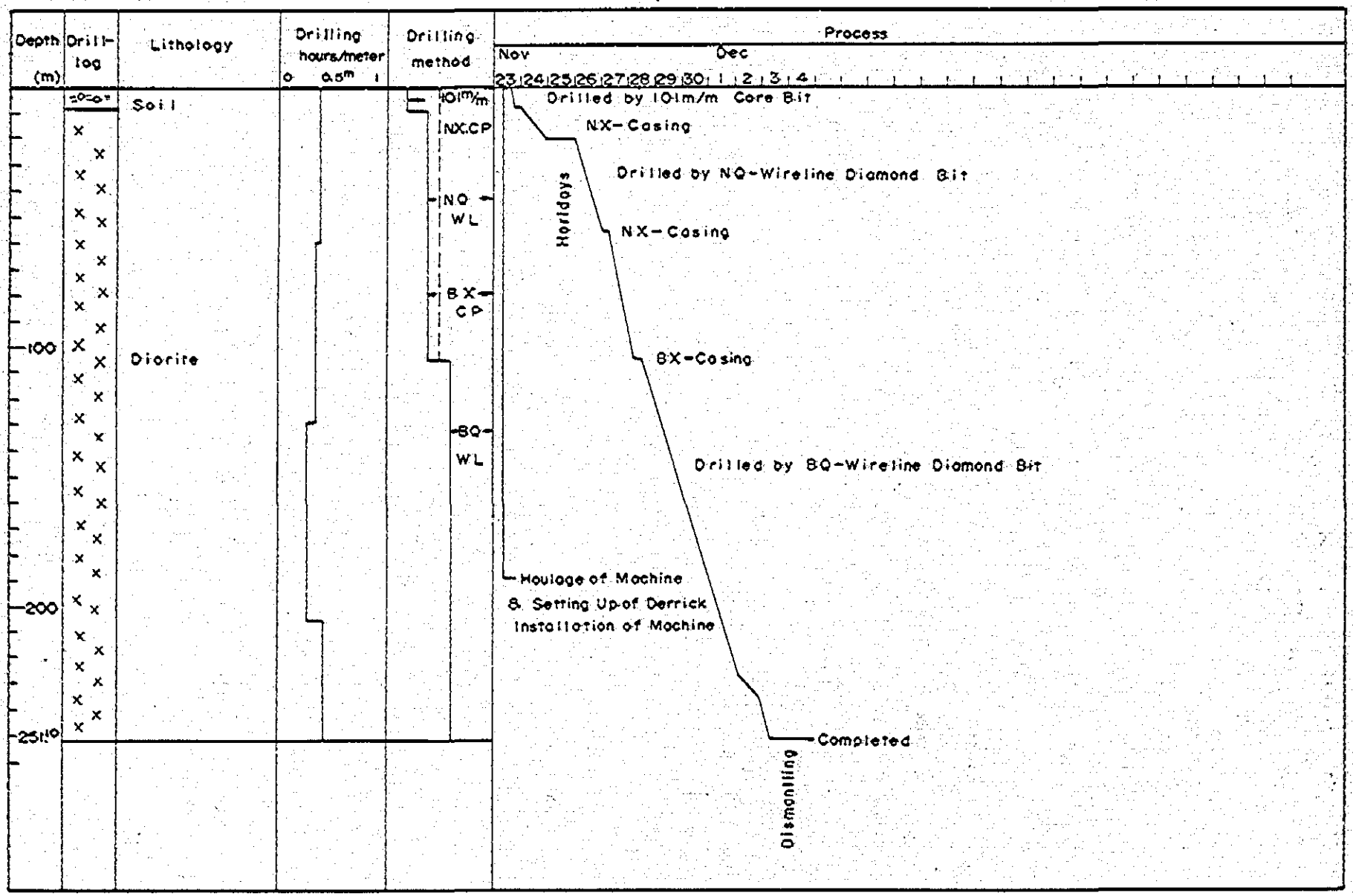
ANNEX 4 TABLE SHOWING DRILLING PROGRESS (DDH-3)



ANNEX 5 TABLE SHOWING DRILLING PROGRESS (DDH-4)



ANNEX 6 TABLE SHOWING DRILLING PROCRESS (DDH-5)



ANNEX 7 TABLE SHOWING DRILLING PROGRESS (DDH-6)