

# **APPENDICES**

## **PART I**

### **Geological Survey**

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A. I-1 List of rock samples.

Geological Index

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Sample No.	Field No.	Location	Geological unit	Rock Name	Geochemical analysis	Thin section	Polished section	Chemical analysis (ore)	X-ray analysis	Fossil	Minor element analysis
925	A701	TV	PU	Limestone	○						
926	A702	TV	PU	Limestone	○						
927	A703	TV	PU	Zebra Dolomite	○						
928	A704	TV	PU	Limestone	○						
929	A705	TV	PU	Limestone	○						
930	A707	TV	PU	Limestone	○						
931	A708	TV	PU	Limestone	○						
932	A709	TV	PU	Limestone	○						
933	A723	GG	PU	Limestone	○						
934	A724	GG	PU	Limestone	○						
935	A725	GG	PU	Limestone	○						
936	A726	GG	PU	Limestone	○						
937	A727	GG	PU	Zebra Dolomite	○						
938	A730	TV	PU	Limestone	○						
939	A732	TV	PU	Dolomitic limestone	○						
940	A733	GG	PU	Limestone	○						
941	A734	GG	PU	Dolostone	○	○					
942	A735	GG	PU	Dolostone	○						
943	A736	GG	PU	Dolostone	○						
944	A737	GG	PU	Limestone	○						
945	A738	GG	PU	Limestone	○						

Sample No.	Field No.	Location	Geological unit	Rock Name	Geochemical analysis	Thin section	Polished section	Chemical analysis (ore)	X-ray analysis	Fossil	Minor element analysis
946	A739	GG	PU	Limestone	○						
947	A741	GG	PU	Dolostone	○						
948	A743	GG	PU	Zebra Dolomite	○						
949	A746	GG	PU	Dolostone	○	○				○	
950	A747	GG	PU	Dolostone	○						
951	A748	GG	PU	Limestone	○						
952	A750	GG	PU	Limestone	○						
953	A751	GG	PU	Dolostone	○						
954	A752	HG	PU	Galena Ore		○		○			
955	A753	HG	PU	Dolostone	○						
956	A754	HG	PU	Dolostone	○						
957	A755	HG	PU	Dolostone	○						○
958	A756	HG	PU	Limestone	○						
959	A757	HG	PU	Limestone	○						
960	A758	HG	PU	Limestone	○						
961	A759	HG	PU	Limestone		○				○	
962	A760	HG	PU	Zebra Dolomite	○						
963	A761	HG	PU	Limestone	○						
964	A762	HG	PU	Dolostone	○						
965	A763	HG	PU	Zebra Dolomite	○						○
966	A764	HG	PU	Limestone	○						

Sample No.	Field No.	Location	Geological unit	Rock Name	Geochemical analysis	Thin section	Polished section	Chemical analysis (ore)	X-ray analysis	Fossil	Minor element analysis
967	A765	HG	PU	Limestone	○						
968	A766	HG	PU	Dolostone	○	○				○	
969	A767	HG	PU	Dolostone	○						
970	A768	SR	PU	Dolostone	○						
971	A770	SR	MI	Quartz porphyry		○					
972	A771	SR	PU	Dolostone	○						
973	A772	SR	PU	Dolostone	○						
974	A773	SR	PU	Dolostone	○						
975	A774	SR	PU	Dolostone	○						
976	A775	SR	PU	Dolostone	○						
977	A776	SR	PU	Limestone	○						
978	A777	SR	PU	Limestone	○						
979	A778	SR	PU	Dolostone	○						
980	A779	SR	PU	Limestone	○						
981	A780	SR	PU	Dolostone	○						
982	A781	SR	PU	Limestone	○						
983	A782	SR	PU	Limestone	○						
984	A783	SR	PU	Limestone	○						
985	A784	SR	PU	Dolostone	○						
986	A785	SR	PU	Limestone	○						
987	A786	SR	PU	Limestone	○						

Sample No.	Field No.	Location	Geological unit	Rock Name	Geochemical analysis	Thin section	Polished section	Chemical analysis (ore)	X-ray analysis	Fossil	Minor element analysis
988	A787	SR	PU	Dolostone	( )						
989	A788	SR	PU	Limestone	( )						
990	A789	SR	PU	Limestone	( )						
991	A790	SR	PU	Dolostone	( )						
992	D 1	HC	PU	Limestone						○	
993	D 2	TV	PU	Limestone						○	
994	D 3	TV	PU	Limestone						○	
995	D 5	TV	PU	Sandstone						○	
996	D 6	TV	PU	Sandstone						○	
997	D 7	TV	PU	Sandstone						○	
998	L702	SR	PU	Limestone	( )						
999	L703	SR	PU	Limestone	( )						
1000	L704	SR	PU	Limestone						○	
1001	L706	SR	PU	Limestone	( )						
1002	L707	S.T-13	PU	Limestone	( )						
1003	L708	S.T-13	PU	Limestone	( )						
1004	L709	S.T-13	PU	Dolostone	( )		○				○
1005	L710	S.T-13	PU	Dolostone	( )						
1006	L711	S.T-13	PU	Dolostone	( )						
1007	L712	S.T-2	PU	Dolomitic sandstone	( )						
1008	L713	S.T-2	PU	Sandy limestone	( )						○

Sample No.	Field No.	Location	Geological unit	Rock Name	Geochemical analysis	Thin section	Polished section	Chemical analysis (ore)	X-ray analysis	Fossil	Minor element analysis
1009	L715	S.T-2	PU	Sandstone	○						
1010	L716	S.T-2	PU	Dolostone	○	○					
1011	L718	S.T-2	PU	Dolostone	○						
1012	L719	S.T-2	PU	Dolostone	○		○				
1013	L720	S.T-2	PU	Dolostone	○						
1014	L721	S.T-2	PU	Dolostone	○						
1015	L722	S.T-2	PU	Dolostone	○						
1016	L723	S.T-2	PU	Dolostone	○						
1017	L724	S.T-2	PU	Dolostone	○						
1018	L725	S.T-2	PU	Limestone	○						
1019	L726	S.T-2	PU	Dolostone	○						○
1020	L727	S.T-2	PU	Dolostone	○						○
1021	L728	S.T-2	PU	Dolostone	○					○	
1022	L729	S.T-2	PU	Dolostone			○	○			
1023	L730	S.T-2	PU	Dolostone				○			
1024	L731	S.T-2	PU	Galena Ore			○	○	○		
1025	L732	S.T-1	PU	Dolostone	○						
1026	L733	S.T-1	PU	Dolostone	○						○
1027	L734	S.T-1	PU	Dolostone	○						
1028	L736	S.T-1	PU	Sandstone	○						
1029	L737	S.T-1	PU	Sandstone	○						



Sample No.	Field No.	Location	Geological unit	Rock Name	Geochemical analysis	Thin section	Polished section	Chemical analysis (ore)	X-ray analysis	Fossil	Minor element analysis
1030	L740	S.T-3	MI	Tuffaceous sandstone		○					
1031	L741	S.T-5	PU	Dolostone	○						○
1032	L742	S.T-5	PU	Dolostone	○						○
1033	L744	S.T-5	PU	Dolostone	○	○					○
1034	L745	S.T-5	PU	Dolostone	○	○					○
1035	L746	S.T-5	PU	Dolostone	○						○
1036	L747	S.T-5	PU	Limestone	○						
1037	L748	S.T-5	PU	Muddy limestone		○				○	
1038	L749	S.T-12	PU	Limestone	○						
1039	L750	S.T-12	PU	Limestone	○						
1040	L751	S.T-12	PU	Limestone	○						
1041	L753	S.T-12	PU	Brecciated limestone	○						
1042	L754	S.T-11	PU	Limestone	○						
1043	L755	S.T-11	PU	Limestone	○						
1044	L757	S.T-11	PU	Limestone	○						
1045	L758	S.T-11	PU	Limestone	○						
1046	L759	T.T-25	PU	Dolostone	○						○
1047	L760	T.T-25	PU	Dolostone	○		○				○
1048	L761	T.T-25	PU	Dolostone	○		○				○
1049	L762	T.T-25	PU	Dolostone	○						○
1050	L763	T.T-25	PU	Zebra Dolomite	○						

Sample No.	Field No.	Location	Geological unit	Rock Name	Geochemical analysis	Thin section	Polished section	Chemical analysis (ore)	X-ray analysis	Fossil	Minor element analysis
1051	L764	T.T-25	PU	Dolostone	○						○
1052	L766	T.T-24	PU	Dolostone	○	○					○
1053	L767	T.T-24	PU	Dolostone	○	○					
1054	L768	T.T-24	PU	Dolostone	○						
1055	L769	T.T-22	PU	Dolostone	○						
1056	L770	T.T-22	PU	Dolostone	○						
1057	L772	T.T-22	PU	Dolostone	○						○
1058	L773	T.T-22	PU	Dolostone	○						
1059	L774	T.T-21	PU	Dolostone	○						
1060	L775	T.T-21	PU	Dolostone	○	○					
1061	L776	T.T-21	PU	Dolostone	○						
1062	L777	T.T-21	PU	Zebra Dolomite	○						
1063	L778	T.T-21	PU	Limestone	○						
1064	L779	T.T-21	PU	Zebra Dolomite	○						
1065	L780	T.T-21	PU	Dolostone	○						
1066	L781	T.T-27	PU	Zebra Dolomite	○						
1067	L782	T.T-27	PU	Zebra Dolomite	○						
1068	L783	S.T-28	PU	Sphalerite, Galena ore			○				○
1069	L783-1	S.T-28	PU	Sphalerite, Galena ore							○
1070	L783-2	S.T-28	PU	Sphalerite, Galena ore							○
1071	L783-3	S.T-28	PU	Sphalerite, Galena ore							○

Sample No.	Field No.	Location	Geological unit	Rock Name	Geochemical analysis	Thin section	Polished section	Chemical analysis (ore)	X-ray analysis	Fossil	Minor element analysis
1072	L783-4	S.T-28	PU	Sphalerite, Galena ore				○			
1073	L783-5	S.T-28	PU	Sphalerite, Galena ore				○			
1074	L784	S.T-28	PU	Sphalerite, Galena ore		○	○		△		
1075	L785	S.T-28	PU	Dolostone	○						○
1076	L786	S.T-28	PU	Dolostone	○						○
1077	L787	S.T-28	PU	Dolostone	○						○
1078	L788	S.T-28	PU	Dolostone	○	○	○				○
1079	L789	S.T-28	PU	Dolostone	○						○
1080	L790	S.T-28	PU	Dolostone	○						○
1081	L791	S.T-28	PU	Dolostone	○						○
1082	L793	S.T-28	PU	Dolostone	○						○
1083	L794	S.T-28	PU	Dolostone	○						○
1084	L795	S.T-28	PU	Dolostone	○						○
1085	L796	S.T-28	PU	Shaly dolostone	○	○	○				○
1086	L797	S.T-28	PU	Dolostone	○						○
1087	L798	SR	PU	Dolostone	○						○
1088	L799	SR	PU	Dolostone	○						○
1089	L800	SR	MP	Quartz porphyry	○						○
1090	L801	SR	MP	Quartz porphyry	○						○
1091	L802	SR	MP	Quartz porphyry	○						○
1092	L803	SR	PU	Limestone	○						○

Sample No.	Field No.	Location	Geological unit	Rock Name	Geochemical analysis	Thin section	Polished section	Chemical analysis (ore)	X-ray analysis	Fossil	Minor element analysis
1093	L804	SR	PU	Limestone	○						
1094	L805	SR	PU	Limestone	○						
1095	L806	SR	MP	Biotite Granite	○						
1096	L807	SR	MP	Granite Porphyry	○						
1097	L808	SR	MP	Liparitic quartz porphyry	○	○					
1098	L809	S.T-28	PU	Sandstone		○					
1099	L810	SR	PU	Dolostone				○			
1100	L811	S.T-29	PU	Sandy dolostone	○			○			
1101	L812	S.T-29	PU	Dolostone	○			○			
1102	L813	S.T-29	PU	Dolostone				○			
1103	L814	S.T-29	PU	Dolostone	○			○			
1104	L815	S.T-29	PU	Dolostone				○			
1105	L816	S.T-29	PU	Dolostone				○			
1106	L817	S.T-29	PU	Dolostone				○			
1107	L818	S.T-29	PU	Dolostone				○			
1108	L819	S.T-29	PU	Dolostone				○			
1109	L820	S.T-29	PU	Dolostone		○		○	△		
1110	L821	S.T-29	PU	Dolostone				○			
1111	L822	S.T-29	PU	Dolostone				○			
1112	L823	S.T-29	PU	Dolostone				○			
1113	L824	S.T-29	PU	Dolostone				○			

Sample No.	Field No.	Location	Geological unit	Rock Name	Geochemical analysis	Thin section	Polished section	Chemical analysis (ore)	X-ray analysis	Fossil	Minor element analysis
1114	1825	S.T-29	PU	Dolostone				○			
1115	1826	S.T-29	PU	Dolostone				○			
1116	N701	TV	PU	Limestone	○	○					
1117	N702	TV	PU	Limestone	○						
1118	N703	TV	PU	Zebra Dolomite	○						○
1119	N704	TV	PU	Dolostone	○						
1120	N705	TV	PU	Dolostone	○						
1121	N706	TV	PU	Zebra Dolomite	○						
1122	N707	TV	PU	Zebra Dolomite	○						
1123	N708	TV	PU	Dolostone	○						
1124	N709	TV	PU	Dolostone	○						
1125	N710	HG	PU	Sandstone	○						
1126	N711	HG	PU	Sandstone	○						
1127	N712	HG	PU	Dolostone	○						
1128	N713	TV	PU	Limestone	○						
1129	N714	TV	PU	Dolostone	○						
1130	N715	TV	PU	Zebra Dolomite	○						
1131	N716	TV	PU	Dolostone	○						
1132	N717	TV	PU	Zebra Dolomite	○						○
1133	N718	TV	PU	Dolostone	○						
1134	N719	TV	PU	Dolostone	○						○

Sample No.	Field No.	Location	Geological unit	Rock Name	Geochemical analysis	Thin section	Polished section	Chemical analysis (ore)	X-ray analysis	Fossil	Minor element analysis
1135	N720	TV	PU	Dolomitic limestone	○						
1136	N721	TV	PU	Limestone	○						
1137	N722	TV	PU	Dolostone	○					○	
1138	N724	TV	PU	Limestone	○	○					
1139	N725	TV	PU	Dolostone	○						
1140	N726	TV	PU	Dolostone	○						○
1141	N727	TV	PU	Dolostone	○						
1142	N728	TV	PU	Dolostone	○	○				○	
1143	N730	TV	PU	Dolostone	○						
1144	N731	TV	PU	Zebra Dolomite	○						
1145	N732	TV	PU	Zebra Dolomite	○						
1146	N741	TV	PU	Dolostone	○						
1147	N743	TV	PU	Dolostone	○						
1148	N746	TV	PU	Dolostone	○		○	○	○		
1149	N747	TV	PU	Dolostone	○						
1150	N748	TV	PU	Dolostone	○						
1151	N749	TV	PU	Dolostone	○						
1152	N752	TV	PU	Dolomite limestone	○					○	
1153	N754	TV	PU	Dolostone	○						
1154	N755	TV	PU	Dolostone	○						
1155	N756	TV	PU	Zebra Dolomite	○						○

Sample No.	Field No.	Location	Geological unit	Rock Name	Geochemical analysis	Thin section	Polished section	Chemical analysis (ore)	X-ray analysis	Fossil	Minor element analysis
1156	N758	HG	PU	Limestone	○	○					
1157	N759	HG	PU	Limestone						○	
1158	N760	HG	PU	Zebra Dolomite	○						
1159	N761	HG	PU	Dolostone	○						
1160	N762	HG	PU	Dolostone	○						
1161	N763	HG	PU	Dolostone	○						
1162	N764	HG	PU	Zebra Dolomite	○						
1163	N768	TV	PU	Sandstone						○	
1164	N769	GG	PU	Dolomitic limestone	○						
1165	N770	GG	PU	Dolomitic limestone	○	○					
1166	N771	GG	PU	Limestone	○						
1167	N774	TV	PU	Dolostone	○						
1168	N781	TV	PU	Limestone	○						
1169	N783	TV	PU	Dolostone	○						
1170	N789	TV	PU	Sandstone	○	○					
1171	N790	HG	PU	Dolostone	○						
1172	N791	HG	PU	Zebra Dolomite	○						
1173	N795	GG	PU	Limestone	○						
1174	N796	GG	PU	Dolostone	○						
1175	N797	GG	PU	Dolostone	○						
1176	N798	GG	PU	Dolostone	○						○

Sample No.	Field No.	Location	Geological unit	Rock Name	Geochemical analysis	Thin section	Polished section	Chemical analysis (ore)	X-ray analysis	Fossil	Minor element analysis
1177	N804	T.T-16	PU	Muddy limestone	○						○
1178	N811	T.T-16	PU	Dolostone	○						
1179	N814	T.T-16	PU	Dolostone	○						
1180	N815	T.T-16	PU	Dolostone	○						
1181	N816	T.T-16	PU	Dolostone	○						
1182	N817	T.T-19	PU	Dolostone	○						
1183	N820	T.T-19	PU	Dolostone	○						
1184	N823	T.T-19	PU	Zebra Dolomite	○						
1185	N826	T.T-19	PU	Dolostone	○						
1186	N827	T.T-20	PU	Dolostone	○						
1187	N829	T.T-20	PU	Dolostone	○						
1188	N830	T.T-20	PU	Dolostone	○						
1189	N831	T.T-20	TD	Altered dolerite	○	○					
1190	N833	T.T-20	PU	Dolostone	○	○			○		○
1191	N835	T.T-20	PU	Zebra Dolomite	○						
1192	N837	T.T-20	PU	Brecciated Dolomite	○						
1193	N838	T.T-15	PU	Dolostone	○	○			○		○
1194	N839	T.T-15	PU	Dolostone	○						
1195	N842	T.T-15	PU	Zebra Dolomite	○						
1196	N843	T.T-15	PU	Dolostone	○						○
1197	N845	T.T-15	PU	Zebra Dolomite	○	○			○		○



Sample No.	Field No.	Location	Geological unit	Rock Name	Geochemical analysis	Thin section	Polished section	Chemical analysis (ore)	X-ray analysis	Fossil	Minor element analysis
1198	N846	T.T-15	PU	Zebra Dolomite	○						○
1199	N847	T.T-15	PU	Dolostone	○						
1200	N849	T.T-17	PU	Dolostone	○				○		
1201	N850	T.T-17	PU	Dolostone	○						
1202	N851	T.T-17	PU	Dolostone	○						
1203	N852	T.T-17	PU	Dolostone	○						
1204	N853	T.T-17	PU	Dolostone	○						
1205	N856	T.T-18	PU	Dolostone	○						
1206	N858	T.T-18	PU	Dolostone	○						
1207	N861	T.T-18	PU	Dolostone	○						
1208	N863	T.T-18	PU	Dolostone	○						
1209	N864	T.T-23	PU	Dolostone	○						
1210	N865	T.T-23	PU	Zebra Dolomite	○						
1211	N867	T.T-23	PU	Dolostone	○						
1212	N868	T.T-23	PU	Dolostone	○						
1213	N869	SR	PU	Dolostone	○						
1214	N871	SR	PU	Dolostone	○						
1215	N873	SR	PU	Dolostone	○						
1216	N875	SR	PU	Dolostone	○						
1217	N876	SR	PU	Dolostone	○						
1218	N877	SR	PU	Limestone	○						

Sample No.	Field No.	Location	Geological unit	Rock Name	Geochemical analysis	Thin section	Polished section	Chemical analysis (ore)	X-ray analysis	Fossil	Minor element analysis
1219	N878	SR	PU	Limestone	○						
1220	N879	SR	PU	Limestone	○						
1221	N880	SR	PU	Dolomitic limestone	○						
1222	N881	SR	PU	Limestone	○						
1223	N884	SR	PU	Limestone	○						
1224	N885	SR	PU	Dolomitic limestone	○						
1225	N887	SR	PU	Limestone	○						
1226	N888	SR	PU	Dolostone	○						
1227	N889	SR	PU	Dolostone	○						
1228	N890	SR	PU	Dolomitic limestone	○						
1229	N892	SR	PU	Dolostone	○						
1230	N893	SR	PU	Dolostone	○					○	
1231	P 1	TV	PU	Dolostone						○	
1232	P 7	TV	PU	Sandstone						○	
1233	P701	TV	PU	Limestone	○						
1234	P703	TV	PU	Dolostone	○						
1235	P705	TV	PU	Limestone	○						
1236	P706	TV	PU	Dolostone	○						
1237	P707	TV	PU	Zebra Dolomite	○						
1238	P710	TV	PU	Dolostone	○						
1239	P713	TV	PU	Limestone	○						

\* P712 (See Sample No. 1377)

Sample No.	Field No.	Location	Geological unit	Rock Name	Geochemical analysis	Thin section	Polished section	Chemical analysis (ore)	X-ray analysis	Fossil	Minor element analysis
1240	P714	TV	PU	Muddy limestone	○						
1241	P717	TV	PU	Limestone	○						
1242	P719	TV	PU	Dolostone	○						
1243	P720	TV	PU	Limestone	○						
1244	P721	TV	PU	Zebra Dolomite	○						
1245	P722	TV	PU	Dolostone	○						
1246	P723	TV	PU	Dolostone	○						
1247	P725	TV	PU	Dolostone	○						
1248	P727	TV	PU	Dolostone	○						
1249	P728	TV	PU	Limestone	○						
1250	P729	TV	PU	Limestone	○						
1251	P730	TV	PU	Dolostone	○						
1252	P731	TV	PU	Dolostone	○						
1253	P737	TV	PU	Dolostone	○						
1254	P738	TV	PU	Dolostone	○						
1255	P739	TV	PU	Dolostone	○						
1256	P750	GG	PU	Limestone	○						○
1257	P752	GG	PU	Dolostone	○						○
1258	P753	GG	PU	Limestone	○						○
1259	P754	GG	PU	Limestone	○	○	○		△		○
1260	P756	GG	PU	Dolostone	○						○

Sample No.	Field No.	Location	Geological unit	Rock Name	Geochemical analysis	Thin section	Polished section	Chemical analysis (ore)	X-ray analysis	Fossil	Minor element analysis
1261	P758	GG	PU	Dolostone	○						
1262	P762	GG	PU	Limestone	○						
1263	P768	GG	PU	Limestone	○						
1264	P770	GG	PU	Limestone	○						
1265	P771	GG	PU	Limestone	○						
1266	P772	GG	PU	Limestone	○						
1267	P773	GG	PU	Limestone	○						
1268	P775	GG	PU	Limestone	○						
1269	P777	GG	PU	Limestone	○						
1270	P778	GG	PU	Limestone	○						
1271	P779	GG	PU	Limestone	○						
1272	P780	GG	PU	Limestone	○						
1273	P782	GG	PU	Limestone	○						
1274	P784	GG	PU	Limestone	○						
1275	P785	HG	PU	Limestone	○						
1276	P786	HG	PU	Limestone	○						
1277	P788	HG	PU	Limestone	○						
1278	P790	HG	PU	Limestone	○						
1279	P792	HG	PU	Limestone	○						
1280	P794	HG	PU	Limestone	○						
1281	P795	HG	PU	Limestone	○						

Sample No.	Field No.	Location	Geological unit	Rock Name	Geochemical analysis	Thin section	Polished section	Chemical analysis (ore)	X-ray analysis	Fossil	Minor element analysis
1282	P797	HG	PU	Limestone	○						
1283	P798	HG	PU	Limestone	○						
1284	P799	HG	PU	Zebra Dolomite	○						
1285	P800	HG	PU	Limestone	○	○	○		○ △		○
1286	P801	HG	PU	Dolostone	○						
1287	P803	HG	PU	Dolostone	○						
1288	P804	HG	PU	Dolostone	○						
1289	P807	HG	PU	Galena Ore			○	○			
1290	P809	SR	PU	Limestone	○						
1291	P810	SR	PU	Dolostone	○						
1292	P811	SR	PU	Dolostone	○						
1293	P813	SR	PU	Limestone	○						
1294	P814	SR	PU	Limestone	○						
1295	P815	SR	PU	Dolostone	○						
1296	P816	SR	PU	Limestone	○						
1297	P817	SR	PU	Limestone	○						
1298	P818	SR	PU	Limestone	○						
1299	P819	SR	PU	Limestone	○						
1300	P820	SR	PU	Limestone	○						
1301	P821	SR	PU	Dolostone	○						
1302	P822	SR	PU	Limestone	○						

Sample No.	Field No.	Location	Geological unit	Rock Name	Geochemical analysis	Thin section	Polished section	Chemical analysis (ore)	X-ray analysis	Fossil	Minor element analysis
1303	P823	SR	PU	Limestone	○						
1304	P824	SR	PU	Dolostone	○						
1305	P825	SR	PU	Limestone	○						
1306	P826	SR	PU	Limestone	○						
1307	P827	SR	PU	Limestone	○						
1308	P828	SR	PU	Limestone	○						
1309	P829	SR	PU	Limestone	○						
1310	P830	SR	PU	Limestone	○						
1311	P831	SR	PU	Limestone	○						
1312	P832	SR	PU	Limestone	○						
1313	S712	TV	PU	Sandstone						○	
1314	S714	TV	PU	Dolomitic limestone	○	○					
1315	S715	TV	PU	Limestone	○						
1316	S716	TV	PU	Dolostone	○						
1317	S718	TV	PU	Limestone	○						
1318	S719	TV	PU	Dolomitic limestone	○						
1319	S721	S.T-4	PU	Dolostone	○						○
1320	S724	S.T-4	PU	Dolostone	○						○
1321	S725	S.T-4	PU	Sphalerite ore		○	○	○	○		
1322	S727	S.T-4	PU	Dolostone	○	○	○				○
1323	S728	S.T-4	PU	Muddy dolostone	○	○	○				○

Sample No.	Field No.	Location	Geological unit	Rock Name	Geochemical analysis	Thin section	Polished section	Chemical analysis (ore)	X-ray analysis	Fossil	Minor element analysis
1324	S729	S.T-4	PU	Muddy dolostone	○						
1325	S730	S.T-4	PU	Muddy dolostone	○	○					○
1326	S732	S.T-4	PU	Dolostone	○						○
1327	S737	S.T-7	PU	Limestone	○						
1328	S738	S.T-7	PU	Limestone	○						
1329	S742	S.T-6	PU	Limestone	○						
1330	S743	S.T-6	PU	Limestone	○						
1331	S746	S.T-6	PU	Limestone	○						
1332	S747	S.T-6	PU	Sandy limestone	○						○
1333	S748	S.T-6	PU	Limestone	○						
1334	S749	S.T-6	PU	Limestone	○						
1335	S751	S.T-8	PU	Limestone	○						
1336	S753	S.T-8	PU	Muddy limestone	○						
1337	S754	S.T-8	PU	Muddy limestone	○						
1338	S755	S.T-8	PU	Limestone	○						
1339	S756	S.T-8	PU	Dolostone	○						
1340	S757	S.T-8	PU	Dolostone	○		○				
1341	S759	S.T-9	PU	Muddy limestone	○						
1342	S761	S.T-9	PU	Dolomitic limestone	○						
1343	S770	T.T-27	PU	Zebra Dolomite	○	○	○				○
1344	S772	T.T-27	PU	Zebra Dolomite	○						

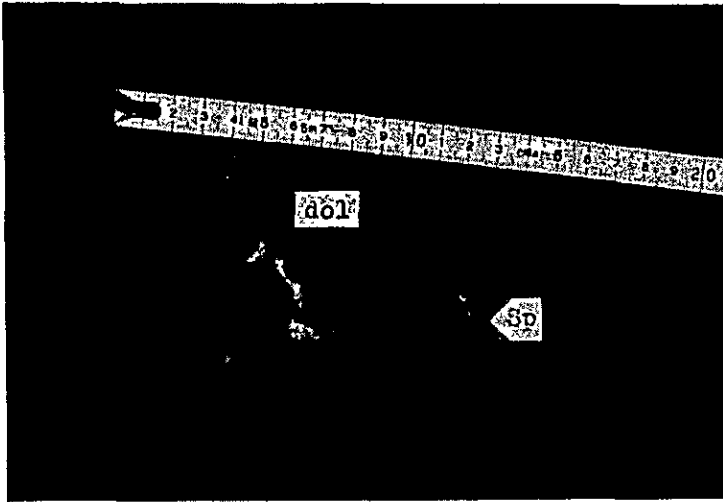
Sample No.	Field No.	Location	Geological unit	Rock Name	Geochemical analysis	Thin section	Polished section	Chemical analysis (ore)	X-ray analysis	Fossil	Minor element analysis
1345	S773	T.T-27	PU	Zebra Dolomite	( )						
1346	S774	T.T-27	PU	Dolostone	( )						
1347	S775	T.T-27	PU	Dolostone	( )						
1348	S776	T.T-27	PU	Dolostone	( )						
1349	S777	T.T-27	PU	Dolostone	( )						
1350	S779	T.T-26	PU	Dolostone	( )	( )	( )				
1351	S780	T.T-26	PU	Dolostone	( )						
1352	S782	T.T-26	PU	Muddy dolostone	( )						
1353	S783	S.T-10	PU	Galena ore	( )	( )	( )	( )	( )	( )	
1354	S785	S.T-10	PU	Limestone	( )						
1355	S786	S.T-10	PU	Muddy limestone	( )						
1356	S788	S.T-10	PU	Muddy limestone	( )						
1357	S789	S.T-10	PU	Dolostone	( )						( )
1358	Z 2	HC	PU	Dolostone	( )						
1359	Z 3	HC	PU	Zebra Dolomite	( )						
1360	Z 4	HC	PU	Dolostone	( )						( )
1361	Z 5	HC	PU	Limestone	( )						
1362	Z 6	HC	PU	Limestone	( )						
1363	Z 7	HC	PU	Dolostone	( )						
1364	Z 8	HC	PU	Limestone	( )						
1365	Z 11	HC	PU	Dolostone	( )						



Sample No.	Field No.	Location	Geological unit	Rock Name	Geochemical analysis	Thin section	Polished section	Chemical analysis (ore)	X-ray analysis	Fossil	Minor element analysis
1366	Z 12	HG	PU	Dolostone	○						
1367	Z 13	HG	PU	Dolostone	○						
1368	Z 14	HG	PU	Limestone	○						
1369	Z 16	HG	PU	Limestone	○						
1370	Z 17	HG	PU	Limestone	○						
1371	Z 18	HG	PU	Limestone	○						
1372	Z 19	HG	PU	Limestone	○						
1373	Z 20	HG	PU	Brecciated limestone	○						
1374	Z 22	GG	PU	Zebra Dolomite	○						
1375	Z 23	GG	PU	Dolostone	○						
1376	Z 24	GG	PU	Limestone	○						
1377	P712	TV	PU	Limestone						○	

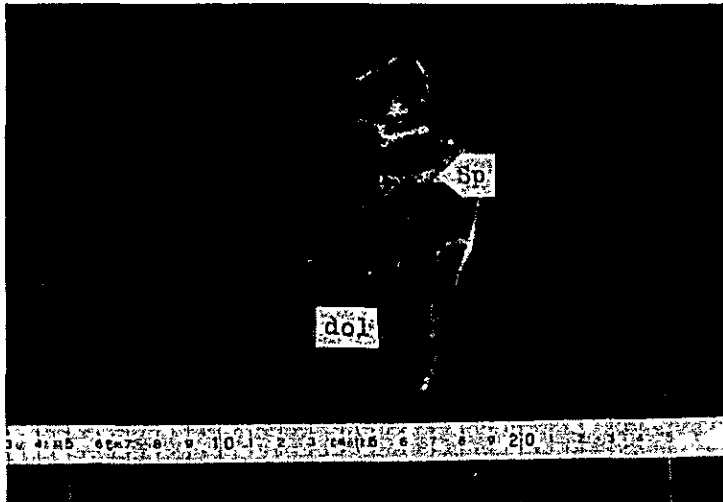
A. I-2 Photographs of ores and others.

Plate 1



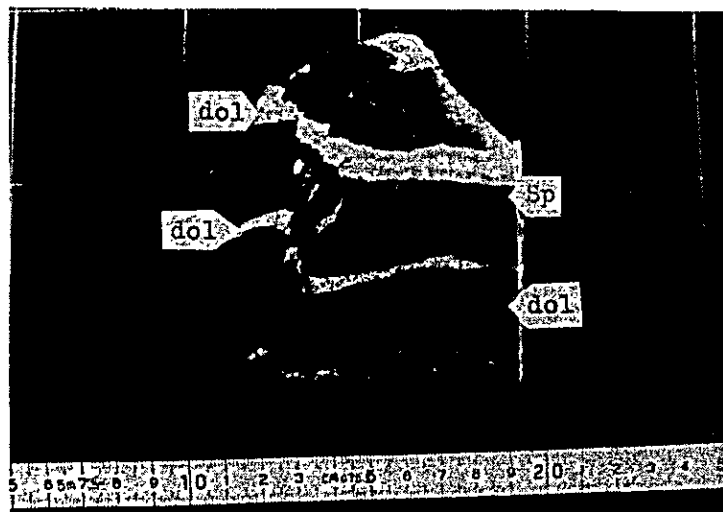
Sphalerite ore of the  
San Roque trench T-28.

Sp : Sphalerite  
dol: Dolostone



Sphalerite ore of the  
San Roque trench T-28.  
(Polished)

Sp : Sphalerite  
dol: Dolostone



Sphalerite ore of the  
San Vicente mine.  
(Polished)

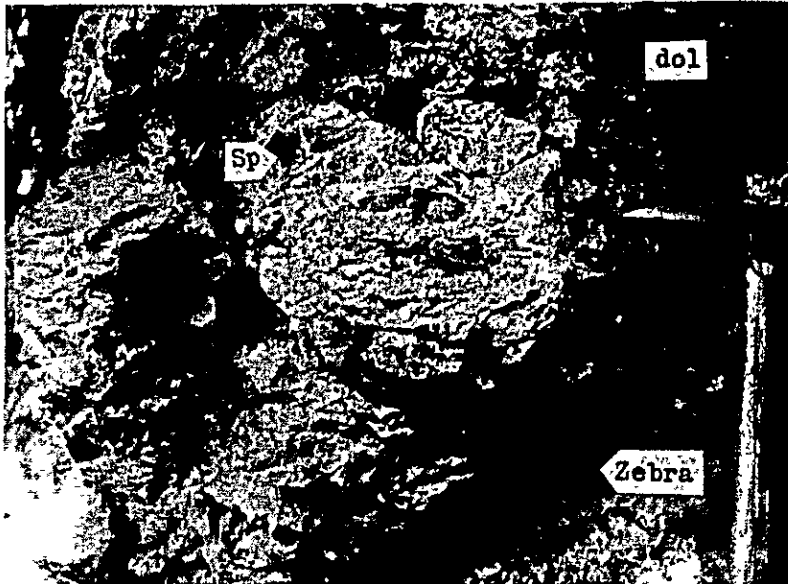
Sp : Sphalerite  
dol: Dolomite

Plate 2



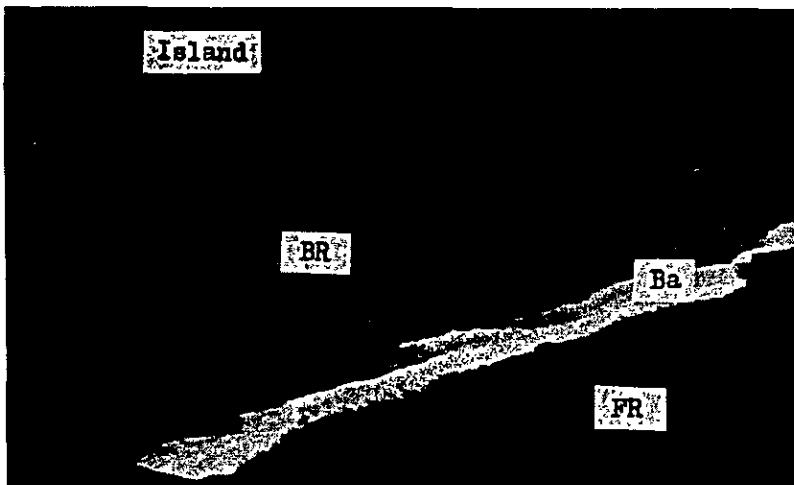
Sphalerite ore of the San Roque trench T-28.

Sp : Sphalerite  
gz : Quartz  
dol: Dolostone



Sphalerite ore of the Tambo Maria showing

Sp : Sphalerite  
dol: Dolostone  
Zebra: Zebra Dolomite

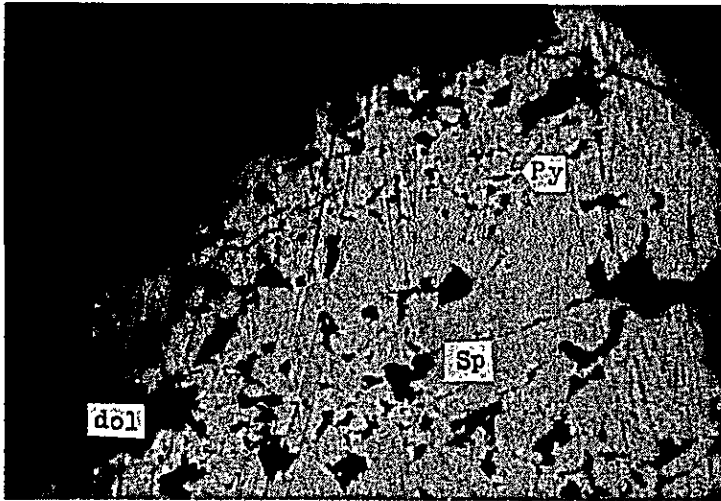


View of the reef developing at present in the Tahiti island

BR: Back Reef  
Ba: Barrier  
FR: Fore Reef

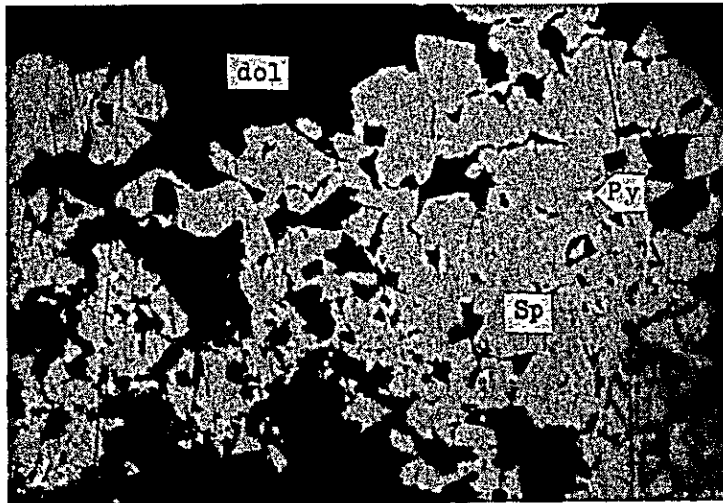
Plate 3

Photomicrograph of  
sphalerite ore of  
the San Vicente mine



Sp : Sphalerite  
Py : Pyrite  
dol: Dolomite

0 0.2 mm



Photomicrograph of  
sphalerite ore of the  
San Vicente mine

Sp : Sphalerite  
Py : Pyrite  
dol: Dolomite

0 0.2 mm

**A. 1-3 Microscopic observation of the thin section.**

## A. I -3 Microscopic observation of the thin section.

\* stained thin section---stained by AgNO<sub>3</sub> and K<sub>2</sub>CrO<sub>4</sub> (1)

Sample No.	Field No.	Locality	Group	Rock Name	Microscopic Observation
941	A734	GG	PU	Dolostone (Dolosparite)	The rock shows mosaic texture and consists mostly of medium crystalline dolomite (100 to 200 $\mu$ in size). Small grains (10 to 30 $\mu$ in size) of opaque minerals are recognized rarely.
971	A770	SR	MI	Quartz Porphyry	The rock shows porphyritic texture. The phenocryst consists of quartz and potash felspar (50 to 200 $\mu$ in size). The ground mass consists of fine grained quartz after hyaline, altered potash felspar, altered biotite and opaque minerals and shows flow structure.
1007	L712	S.T-2	PU	Dolomitic sandstone	The rock consists of chalcedonic quartz (80-90%) and micritic dolomite (10-20%). Chalcedonic quartz formed microspheroid (50 to 100 $\mu$ ) is densely spotted in micritic dolomite. Frequently dolerthoms are observed (10 to 20 $\mu$ ) in the matrix. Rarely sparry calcite up to 400 $\mu$ in size, forming long crescents or wisps, is recognized.
1010	L716	S.T-2	PU	Dolostone (Skeltal dolomicrite)	The rock consists of micritic dolomite (70-80%), sparry calcite (10-20%) and chalcedonic quartz (<5%). Brachiopods shells and crinoids (?) are observed. They are composed of sparry calcite aggregates up to 6x3 mm. Rarely sponge spicules of periferia are observed.
1030	L740	S.T-3	MI	Tuffaceous sandstone	The rock consists of vitreous material, clayey material, quartz and potash felspar. The fragments of quartz (30 to 100 $\mu$ ) show corroded form and is recognized reaction rim. The matrix (60-70%) is composed of vitreous material, clayey material, quartz and felspar and its grain size up to 20 $\mu$ .
1033	L744	S.T-5	PU	Dolostone (Dolomicrite)	The rock consists of micritic dolomite (70-80%) and sparry calcite. Calcite aggregates 5-10 grains in the matrix of dolomite or along fissure. Detrital quartz is rarely observed in the matrix forming subrounded to subangular (10 to 40 $\mu$ ).
1034	L745	S.T-5	PU	Dolostone (Dolosparmicrite)	The rock consists of sparry dolomite (60-70%), micritic dolomite (10-15%), sparry calcite (5-10%) and detrital quartz (1.5-1.0%). The sparry dolomite aggregates of 3 grains or more and is scattered in the micrite matrix. Calcite exists rarely and the crystal is anhedral to subhedral (150 to 300 $\mu$ ).

Sample No.	Field No.	Locality	Group	Rock Name	Microscopic Observation
1048	L761	T.T-25	PU	Dolostone (Dolosparite)	The rock consists of almost sparry dolomite (>99%) and shows mosaic texture. Calcite exists very rarely as anhedral crystal replaced by dolorhoms. Dolomite crystal is very large up to 600 $\mu$ . (* Stained thin section)
1052	L766	T.T-24	PU	Dolostone (Dolosparite)	The rock consists of almost sparry dolomite (>95%) and shows mosaic texture. Calcite (=2%) and detrital quartz (=2%) exists very rarely. The crystal size of sparry dolomite is up to 30 $\mu$ . Opaque mineral (=1%) is recognized rarely and is scattered in the matrix (20 to 30 $\mu$ in size).
1053	L767	T.T-24	PU	Dolostone (Dolosparite)	The rock consists of almost sparry dolomite (>99%) and shows mosaic texture. Sparry calcite and detrital quartz is very few. The crystal size of sparry dolomite is up to 600 $\mu$ . Opaque minerals are recognized very rarely and their sizes are about 10 $\mu$ .
1060	L775	T.T-21	PU	Dolostone (Dolosparite)	The rock consists of almost sparry dolomite (>98%) and shows mosaic texture of subhedra, up to 100 $\mu$ in size. Very rarely sparry calcite up to 50 $\mu$ in size, and detrital quartz up to 20 $\mu$ in size exist.
1074	L784	S.T-28	PU	Dolostone (Dolosparite with sphalerite and galena)	The rock consists of sparry dolomite (=75%) and sphalerite (=20%). Sparry dolomite shows mosaic texture of subhedra to anhedra (30 to 80 $\mu$ ). Sphalerite exists near the larger dolomite crystals and shows translucently dark reddish brown in color. Opaque minerals (5 to 20 $\mu$ ) occur rarely. (* Stained thin section)
1078	L788	S.T-28	PU	Dolostone (Dolomifrite)	The rock consists of micritic dolomite (=80%), megacrystal quartz (=10%), sphalerite (=5%). Micritic dolomite rarely includes sparry calcite up to 100 $\mu$ in size. Megacrystal quartz aggregates of five or more grains (200 to 700 $\mu$ in size). Sphalerite shows high relief in dark reddish brown color. (* Stained thin section)
1084	L795	S.T-28	PU	Dolostone (Dolomifrite)	The rock consists of micritic dolomite (>90%), sparry dolomite (<5%), quartz (=2%), and a few sphalerite (=2%). Micritic dolomite shows cryptocystal-line up to 5 $\mu$ in size, forming matrix. Sparry dolomite aggregates of five grains or more and forms vein like shape. Almost quartz may be derived from terrigenous sediment as detritus. Frequently sphalerite is observed as anhedral forming nearly microspheroid up to 400 $\mu$ in diameter. Rarely opaque mineral is observed in irregular shape up to 10 $\mu$ . (* Stained thin section)



(3)

Sample No.	Field No.	Locality	Group	Rock Name	Microscopic Observation
1085	L796	S.T-28	PU	Shaly Dolostone (Dolomicrite)	The rock consists of micritic dolomite (>85%), sparry dolomite ( $\approx$ 10%), calcite ( $\approx$ 2%) and detrital quartz ( $\approx$ 2%). Micritic dolomite shows cryptocrystalline of anhedral and forms matrix. Sparry dolomite scarcely exists up to 200 $\mu$ in size. Sparry calcite is rarely observed in anhedral shape. Detrital quartz is scarcely observed in the matrix up to 20 $\mu$ in size.
1097	L808	SR	MP	Liparitic Quartz- porphyry	The rock is composed of ground mass ( $\approx$ 90%) and phenocrysts ( $\approx$ 10%). The ground mass consists of detrital quartz ( $\approx$ 70%) and hyaline showing flow structure. Phenocrysts consist of potash felspar, plagioclase and quartz. Potash felspar partly alters to clay minerals. Plagioclase shows albite twin up to 18 $\mu$ in size. Phenocryst quartz of subhedra forms aggregates up to 500 $\mu$ in size.
1098	L809	S.T-28	PU	Sandstone (Cherty sandstone)	The rock consists of chalcedonic quartz (>90%) and detrital quartz (<10%). The matrix is composed of chalcedonic quartz up to 20 $\mu$ in size partly micro-spheroid or showing radiated structure. Detrital quartz is scattered in the matrix up to 30 $\mu$ in size with detrital felspar.
1109	L820	S.T-29	PU	Dolostone	The rock is composed of dolomite ( $\approx$ 80%), calcite (<10%), opaque minerals ( $\approx$ 10%) and detrital quartz ( $\approx$ 0.5%). Dolomite consists of micrite (50-60%) and sparite (40-50%). Sparry dolomite shows mosaic texture up to 400 $\mu$ in size. Micritic dolomite forms matrix, 2-10 $\mu$ in size. Calcite crystals are almost sparry 50-200 $\mu$ in size. Detrital quartz is very rare and is scattered in the micritic dolomite. Opaque minerals are common forming in various shape but partly cubic up to 50 $\mu$ in size. Translucent mineral, dark reddish brown in color, may be sphaerite and exists along fissure or in the matrix up to 400 $\mu$ in size.
1116	N701	IV	PU	Limestone (Pelsparite)	The rock consists of pellets (100 to 500 $\mu$ in diameter) surrounded by sparry calcite (50 to 200 $\mu$ in size). Detrital quartz (30 to 40 $\mu$ in size) is recognized in the pellet. Very small grains (less than 10 $\mu$ in size) of opaque minerals are recognized rarely.
1126	N711	HC	PU	Sandstone	The rock is composed of 50 percent of rounded calcite (50 to 100 $\mu$ in diameter) and several percent of detrital quartz, which are cemented by remnants, dark brown to black clayey material.

Sample No.	Field No.	Locality	Group	Rock Name	Microscopic Observation
1132	N717	TV	PU	Zebra Dolomite	The rock shows mosaic texture and consists of coarse crystalline dolomite (300 to 900 $\mu$ in size) in subhedral.
1133	N718	TV	PU	Dolostone (Dolosparite)	The rock shows mosaic texture and consists of coarse crystalline dolomite (300 to 900 $\mu$ in size) in subhedral.
1142	N728	TV	PU	Limestone (Pelsparite)	The rock consists of oolite and pellet surrounded by sparry calcite (10 to 30 $\mu$ in size). Several per cent of detrital quartz (10 to 30 $\mu$ in size) occur in sparry calcite, oolite and pellet. Very small grains (less than 10 $\mu$ in size) of opaque mineral are recognized rarely.
1156	N758	HC	PU	Limestone (Micrite)	The rock consists mostly of micritic carbonate mineral (calcite) and a few per cent of detrital quartz (10 to 20 $\mu$ in grain size). Opaque minerals (10 to 20 $\mu$ in size) occur rarely.
1165	N770	TV	PU	Limestone (Micrite)	The rock consists of mainly micrite and partially sparry calcite and a few per cent of detrital quartz (10 to 20 $\mu$ in grain size). Opaque minerals (10 to 20 $\mu$ in size) occur rarely in sparry calcite.
1170	N789	TV	PU	Limestone (Sparite)	The rock consists of 80 per cent of sparry calcite (40 to 60 $\mu$ in size) and clayey brown material cemented by calcite grains. A few per cent of rounded and cubic opaque minerals are observed. Small grains of detrital quartz and feldspar are scattered.
1189	N831	T.T-20	post-PU	Altered dolerite	The rock consists of clinopyroxene (30-40%), plagioclase ( $\approx$ 30%), olivine ( $\approx$ 15%), opaque minerals (<5%) and clayey materials ( $\approx$ 10%). Above texture shows poikilitic. Clinopyroxene up to 700 $\mu$ formed euhedra shows higher index of refraction than that of plagioclase. The pleochroism of clinopyroxene is weak. The pyroxene grains are partly altered to clayey materials at their rim or along fractures. Plagioclase formed subhedra up to 2 mm, alters partially to clayey materials. Clayey materials derived from plagioclase or clinopyroxene shows low interference color and low grade index of refraction. Olivine included in plagioclase shows very high index of refractions and forms euhedra.

Sample No.	Field No.	Locality	Group	Rock Name	Microscopic Observation
1190	N833	T.T-20	PU	Dolostone (Dolosparite)	The rock consists of almost sparry and micritic dolomite (>97%). Accessory minerals are calcite (<1%), quartz (<1%) and opaque. Sparry dolomite up to 300 $\mu$ in size is over 90% of total dolomite, and the remnant is micritic. The former shows mosaic texture of subhedra to anhedral and the latter fills cavities of sparry dolomite. Calcite crystals are very large up to 800 $\mu$ in size. Chalcedonic quartz forms microsphere or micro ellipsoid up to 50 $\mu$ in diameter.
1193	N838	T.T-20	PU	Dolostone (Dolosparite)	The rock consists of almost sparry dolomite (>99%). Accessory minerals are detrital quartz and opaque (<1%). Sparry dolomite may be classified larger crystals (200 to 500 $\mu$ ) and smaller crystals (30-100 $\mu$ ). Both of them in subhedra to anhedral shows mosaic texture. Detrital quartz shows fragment shape up to 50 $\mu$ in size. Opaque mineral shows irregular shape up to 50 $\mu$ in size and partly microsphere.
1197	N845	T.T-15	PU	Zebra Dolomite	The rock consists of almost sparry dolomite (>99%) with opaque minerals (<1%). Sparry dolomite can be classified into megacrystals (1mm. to 3 mm. in size) and smaller crystals (up to 80 $\mu$ in size). Both of them form banded structure alternatively and show mosaic texture. Opaque minerals show irregular shape filling cavities of dolomite crystals.
1236	P706	TV	PU	Dolostone (Dolosparite)	The rock shows mosaic texture and consists of medium to coarse crystalline dolomite (100 to 500 $\mu$ in size). Chalcedonic quartz is recognized in spherical shape (600 $\mu$ in diameter). Small grains of rounded opaque mineral occur rarely.
1237	P707	TV	PU	Zebra Dolomite	The rock consists of almost sparry dolomite (>99%) with opaque minerals. Sparry dolomite can be classified into megacrystals (200 to 500 $\mu$ in size) and smaller crystals (up to 200 $\mu$ in size). Opaque minerals are very rarely observed (up to 20 $\mu$ in size).
1285	P800	HG	PU	Limestone (Sparite)	The rock shows mosaic texture, and consists of mostly sparry calcite (50 to 150 $\mu$ partially 300 to 500 $\mu$ in size) and several per cent of detrital quartz. The spheroid of chalcedonic quartz is rarely recognized (50 $\mu$ in diameter). A few per cent of opaque minerals are observed and small sphalerite grains (30 $\mu$ in size) are recognized in sparry calcite.

Sample No.	Field No.	Locality	Group	Rock Name	Microscopic Observation
1314	S714	TV	PU	Oolitic Chert	The rock consists of mostly oolite (100-150 $\mu$ in diameter) composed of microcrystals of quartz. Cemented material amid the oolite is made up of amorphous quartz, organic matters and opaque minerals up to a few microns.
1321	S725	S.T-4	PU	Dolosparrite with sphaalerite	The rock consists of dolomite ( $\approx$ 50%), quartz ( $\approx$ 30%), smithsonite ( $\approx$ 10%), hemimorphite ( $\approx$ 5%), sphaalerite ( $\approx$ 5%) and opaque minerals (<1%). Dolomite crystals are various in size and may be classified into megacrystal, smaller and micritic. Megacrystals of dolomite (700 to 1200 $\mu$ in size) are observed in the vicinity of sphaalerite. Smaller crystals (100 to 200 $\mu$ in size) are recognized forming aggregate in the micritic matrix. Micritic dolomite shows partly peltal form but almost makes up the matrix. Quartz shows megacrystal of euhedra or subhedra in the vicinity of sphaalerite (300 to 800 $\mu$ in size). Sphaalerite colored very dark reddish brown is observed in subhedral shape (100 to 500 $\mu$ ). Sphaalerite is almost replaced by smithsonite in lattice form and surrounded aureole. Hemimorphite also secondary mineral shows radiated structure with smithsonite (300 to 400 $\mu$ ). Opaque minerals are very rarely recognized in irregular shape spotting in the matrix (10 to 50 $\mu$ ). (* Stained thin section)
1322	S727	S.T-4	PU	Dolostone (Dolomicrite)	The rock consists of micritic dolomite ( $\approx$ 85%), quartz ( $\approx$ 15%), calcite (<1%) and opaque minerals ( $\approx$ 1%). Micritic dolomite constitutes matrix in equigranular cryptocrystalline grain (2 to 5 $\mu$ ). Quartz is recognized as chalcedony and detritus. Chalcedonic quartz exists more than 80% in all quartz and fills cavities of dolomite crystals. Detrital quartz (20 to 60 $\mu$ ) in subangular to subrounded form are scattered in the matrix. Calcite is very rare up to 200 $\mu$ in size and partly aggregates. Opaque minerals in irregular shape up to 30 $\mu$ in size are observed in the matrix.
1323	S728	S.T-4	PU	Muddy dolostone (Micritic dololutite)	The rock consists of micritic dolomite (50-60%), quartz (40-50%) and opaque minerals ( $\leq$ 2%). Micritic dolomite formed matrix up to 10 $\mu$ in size rarely includes anhedral calcite 20 to 50 $\mu$ in diameter. Quartz exists in two different types i.e. chalcedony and detritus. Chalcedonic quartz formed microspheroid, blob, sponge spicule and elongated ellipsoid up to 100 $\mu$ fills up cavities of dolomite grains. Detrital quartz grains up to 50 $\mu$ in size are scattered in the matrix. Opaque minerals are very fine grained and show partly cubic form up to 15 $\mu$ in size.

(7)

Sample No.	Field No.	Locality	Group	Rock Name	Microscopic Observation
1325	S730	S.T-4	PU	Muddy dolostone (Micritic dololuitite)	The rock consists of micritic dolomite (70-80%), quartz (20-30%) and opaque minerals ( $\leq 1\%$ ). Micritic dolomite formed matrix up to 10 $\mu$ rarely includes an anhedral calcite (30 to 50 $\mu$ ). Quartz is recognized as chalcedony and detritus. Chalcedonic quartz in irregular shape fills cavities among dolomite crystals (20 to 50 $\mu$ ). Detrital quartz shows angular to subangular fragment. Opaque minerals are rarely observed in irregular shape up to 10 $\mu$ in size.
1343	S770	T.T-27	PU	Zebra Dolomite	The rock consists of well crystalline dolomite (>99%) and opaque minerals (<1%), and shows mosaic texture. Dolomite may be classified into megacrystals (500 $\mu$ x 600 $\mu$ to 500 $\mu$ x 1500 $\mu$ ) and smaller crystals (20 $\mu$ to 100 $\mu$ ). The both of them forms so-called zebra structure alternatively. Opaque minerals are very rare. (* Stained thin section)
1350	S779	T.T-26	PU	Dolostone	The rock consists of well crystalline dolomite ( $\approx 99\%$ ) and calcite ( $\approx 1\%$ , stained), showing mosaic texture of subhedra. Dolomite crystals are recognized as megacrystal (100 to 500 $\mu$ in size) and small crystal (10 to 50 $\mu$ in size). (* Stained thin section)

A. I-4 Microscopic observation of the polished section.

## A. I -4 Microscopic observation of the polished section.

(1)

Sample No.	Field No.	Locality	Rock Name	Reflecting Microscopic Observation												
954	A752	HG	Galena ore	<p>The ore mineral is almost composed of galena. Galena is pure white in color and is replaced by cerussite along cleavage and fractures in veinlet-like or network-like. Cerussite also exists surrounding galena (10<math>\mu</math> to 50<math>\mu</math> in width). Anisotropism of cerussite is very clear. Gangue minerals (Fluorite) are included in galena up to 100<math>\mu</math> in size.</p> <p style="text-align: center;"> <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="padding: 0 10px;">Cu</td> <td style="padding: 0 10px;">Pb</td> <td style="padding: 0 10px;">Zn</td> <td style="padding: 0 10px;">Ag</td> </tr> <tr> <td style="padding: 0 10px;">8 ppm,</td> <td style="padding: 0 10px;">25.80 %,</td> <td style="padding: 0 10px;">0.11 %,</td> <td style="padding: 0 10px;">74.0 g/t</td> </tr> </table> </p>	Cu	Pb	Zn	Ag	8 ppm,	25.80 %,	0.11 %,	74.0 g/t				
Cu	Pb	Zn	Ag													
8 ppm,	25.80 %,	0.11 %,	74.0 g/t													
1004	L709	S.T-13	Dolostone	<p>The ore minerals are recognized as sphalerite, pyrite, goethite, and lepidocrocite. Sphalerite exists very rare in irregular shape 5 to 50<math>\mu</math> in size, and is scattered in the matrix. Pyrite, creamy yellow in color, very fine grained up to 10<math>\mu</math> in framboidal form is spotted in the matrix. The both of goethite and lepidocrocite is derived from pyrite in pseudomorph, 20 to 50<math>\mu</math> in size. The former is brighter than the latter in color or the latter more bluish tint.</p>												
1012	L719	S.T-2	Dolostone	<p>The ore minerals are observed as goethite, sphalerite, and pyrite. Goethite, pseudomorph after pyrite of cube up to 50<math>\mu</math> in size, is scattered in the fine grained dolomite. Lepidocrocite is frequently observed with goethite just like exsolution texture. Sphalerite is rarely recognized as irregular shape in dark grey brownish tint color (20 to 50<math>\mu</math> in size). Pyrite is replaced by goethite and lepidocrocite, the remnant of alteration is very rare. Pyrite, creamy yellow in color formed in microspheroid, is scattered as monograin in the matrix of dolomite.</p> <p style="text-align: center;"> <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="padding: 0 10px;">Cu</td> <td style="padding: 0 10px;">Pb</td> <td style="padding: 0 10px;">Zn</td> </tr> <tr> <td style="padding: 0 10px;">8 ppm,</td> <td style="padding: 0 10px;">51 ppm,</td> <td style="padding: 0 10px;">6,120 ppm</td> </tr> </table> </p> <p style="text-align: center;"> <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="padding: 0 10px;">Cu</td> <td style="padding: 0 10px;">Pb</td> <td style="padding: 0 10px;">Zn</td> </tr> <tr> <td style="padding: 0 10px;">16 ppm,</td> <td style="padding: 0 10px;">217 ppm,</td> <td style="padding: 0 10px;">1,360 ppm</td> </tr> </table> </p>	Cu	Pb	Zn	8 ppm,	51 ppm,	6,120 ppm	Cu	Pb	Zn	16 ppm,	217 ppm,	1,360 ppm
Cu	Pb	Zn														
8 ppm,	51 ppm,	6,120 ppm														
Cu	Pb	Zn														
16 ppm,	217 ppm,	1,360 ppm														

Sample No.	Field No.	Locality	Rock Name	Reflecting Microscopic Observation
1022	L729	S.T-2	Dolostone	<p>The ore minerals are observed as galena, cerussite, goethite, and pyrite. Galena up to 2mm. x 3 mm. in size of anhedral, is adjacent to chaledomic quartz. Cerussite replaces galena grains along the cleavage or around the rim. Cerussite also exists in veinlet like form among dolomite and quartz crystals (10-50u in width). Goethite associated with lepidocrocite (more bluish) is recognized as pseudomorph after pyrite in cube or framboid. Pyrite is rarely recognized as remnant of alteration to goethite in cube or as aggregates (5 to 30u in size).</p> <p style="text-align: center;">           Cu      Pb      Zn      Ag            10 ppm,   0.09 %,   0.35 %,   8.0 g/t         </p>
1024	L731	S.T-2	Galena ore	<p>The specimen is mostly composed of galena. Galena is replaced by cerussite along the fractures or the rim up to 50u in width. Galena partly includes gangue minerals (fluorite) in irregular shape.</p> <p style="text-align: center;">           Cu      Pb      Zn      Ag            10 ppm,   77.30 %,   0.016 %,   40.0 g/t         </p>
1047	L760	T.T-25	Dolostone	<p>The specimen is mainly composed of fine grained dolomite. The ore minerals are recognized as pyrite, goethite, and sphalerite. Pyrite is rarely observed in very fine grained framboids and cubes (5-20u in size). Goethite is rarely observed as pseudomorph after framboidal pyrite. Sphalerite is very rare mineral filling cavities of dolomite crystals (10 to 20u). The lead mineral is not identified.</p> <p style="text-align: center;">           Cu      Pb      Zn            3 ppm,   1,500 ppm,   15 ppm         </p>
1048	L761	T.T-25	Dolostone	<p>The specimen is mainly composed of fine grained dolomite. Goethite is rarely observed as pseudomorph after pyrite in cubic or framboidal form (20 to 30u in size). Pyrite is almost framboidal derived from mineralized bacteria (?) (5-10u in diameter). Lepidocrocite filling fractures of dolomite accompanies with goethite. Sphalerite is very rare mineral in irregular shape 5 to 20u in size.</p> <p style="text-align: center;">           Cu      Pb      Zn            8 ppm,   31 ppm,   19 ppm         </p>



Sample No.	Field No.	Locality	Rock Name	Reflecting Microscopic Observation
1068	L783	S.T-28	Sphalerite, Galena ore	<p>The ore minerals are recognized as sphalerite, galena, smithsonite, cerussite, pyrite, and goethite. Sphalerite filled many fractures up to 10 mm. in width coexists with galena and alters partly to smithsonite. Surrounding rim of galena and along cleavage of galena, cerussite is recognized.</p> <p>Galena of anhedral shape (1 to 3 mm. in width). Smithsonite derived from sphalerite in vein-like or in lattice form is colored very dark grey brownish tint and shows clear anisotropism. Cerussite derived from galena in veinlet like or network is pure grey in color. The strong reflection pleochroism is observed. Pyrite is rarely recognized as the relict of alteration to goethite up to 20<math>\mu</math> in size. Goethite is often observed with lepidocrocite in the matrix as the pseudomorph after pyrite (5 to 10<math>\mu</math> in size).</p> <p style="text-align: center;">Cu      Pb      Zn      Ag 24 ppm,    0.15 %,    20.72 %,    24.0 g/t</p>
1074	L784	S.T-28	Sphalerite, Galena ore	<p>The ore minerals are determined as sphalerite, goethite, lepidocrocite, pyrite, smithsonite, and galena. Sphalerite filled fracture in vein like up to 2mm. in width is colored dark grey brownish tint. The internal reflections are very numerous. Goethite coexisted frequently with lepidocrocite in pseudo-exsolution grain of euhedra or as aggregate in the matrix up to 20<math>\mu</math> in size. Smithsonite derived from sphalerite exists along the cleavage and the rim in network form up to 30<math>\mu</math> in width. Galena associated with sphalerite up to 1 mm. x 1.5 mm in size is purely white in color and is partly replaced by cerussite along the cleavage and the aureole. (not analyzed)</p>
1078	L788	S.T-28	Dolostone	<p>The ore minerals are determined as goethite, lepidocrocite, pyrite, and sphalerite. Goethite colored dark grey bluish tint is recognized as pseudomorph after framboidal pyrite up to 100<math>\mu</math> in size. Lepidocrocite often accompanies with goethite in pseudo-exsolution texture. The distinction between the goethite and lepidocrocite is very difficult, the former is a little darker in bluish grey than the latter. Pyrite is the only remnant of replacement to the goethite and lepidocrocite and is dispersed in the matrix (2 to 20<math>\mu</math> in size). Sphalerite is scarcely observed in irregular shape showing dark grey brownish tint in color (5 to 10<math>\mu</math> in size).</p> <p style="text-align: center;">Cu      Pb      Zn 4 ppm,    107 ppm,    760 ppm</p>

(4)

Sample No.	Field No.	Locality	Rock Name	Reflecting Microscopic Observation
1084	L795	S.T-28	Dolostone	<p>The ore minerals are determined as goethite, lepidocrocite, pyrite, and sphalerite. Both goethite and lepidocrocite are recognized as pseudomorph after pyrite and form myrmekitic texture. Pyrite is rarely recognized as the remnant of replacement and exists in monograin up to 20<math>\mu</math> in size. Sphalerite is scarcely observed filling cavities of dolomite crystals in irregular shape up to 50<math>\mu</math> in size.</p> <p style="text-align: center;">Cu            Pb            Zn 3 ppm,      2,320 ppm,    7,160 ppm</p>
1085	L796	S.T-28	Shaly dolostone	<p>The ore minerals are very few and are determined as goethite, lepidocrocite, pyrite, and sphalerite. Goethite derived from framboidal or cubic pyrite grows in cavities up to 100<math>\mu</math> in size. Lepidocrocite also replaced pyrite with goethite in myrmekitic texture is colored grey bluish tint. Pyrite, the remnant of replacement is ordinarily framboidal or aggregates in cubic crystals up to 100<math>\mu</math> in size. Sphalerite is very rare mineral and shows colloform structure up to 30<math>\mu</math> in size.</p>
1109	L820	S.T-29	Dolostone with sphalerite	<p style="text-align: center;">Cu            Pb            Zn 4 ppm,      146 ppm,      558 ppm</p> <p>The specimen shows sphalerite ore in vein-like form with lepidocrocite up to 2 mm in width. The ore minerals consist of sphalerite, goethite with lepidocrocite, smithsonite, and pyrite. Sphalerite formed in vein-like up to 3mm x 8mm in grain size is replaced by smithsonite along the cleavage and the rim. Both goethite and lepidocrocite are recognized as pseudomorph after pyrite and form myrmekitic texture (100<math>\mu</math> x 500<math>\mu</math> to 2 mm x 1.5 mm in size). Smithsonite derived from sphalerite shows lattice form up to 30<math>\mu</math> in width. Framboidal pyrite up to 20<math>\mu</math> in size is rarely recognized as the remnant of replacement to goethite.</p> <p style="text-align: center;">Cu            Pb            Zn            Ag 8 ppm,      0.16 %,      10.74 %,      23.5 g/t</p>

Sample No.	Field No.	Locality	Rock Name	Reflecting Microscopic Observation
1148	N746	IV	Galena ore	<p>The specimen shows galena ore with calcite. Galena (7mm x 7mm) shows pure white in color and is replaced by cerussite along cleavage, fractures and surrounding rim. Cerussite is grey in color and the reflection pleochroism is clear.</p> <p>Cu                      Pb                      Zn                      Ag  20 ppm,                      4.33 %,                      0.01 %,                      18.0 g/t</p>
1259	P754	GC	Limestone	<p>The ore minerals are recognized as goethite, pyrite, and sphalerite. Goethite shows very fine grained aggregate (up to 5μ) and is partly observed as pseudomorph after pyrite up to 50μ in size. Frambooidal pyrite is rarely observed up to 5μ in diameter. Sphalerite is very rare mineral forming microsphere or irregular shape up to 10μ in size.</p> <p>Cu                      Pb                      Zn  5 ppm,                      222 ppm,                      648 ppm</p>
1285	P800	HG	Limestone	<p>The ore minerals are determined as pyrite, goethite, and sphalerite. Frambooidal pyrite shows in aggregate form 70 to 100μ in diameter and is partly replaced by goethite up to 5μ in size in the finer grained calcite. Sphalerite spotted in cavities and fractures up to 150μ is partly replaced by hemimorphite and smithsonite.</p> <p>Cu                      Pb                      Zn  3 ppm,                      26 ppm,                      1,270 ppm</p>
1289	P807	HG	Galena ore	<p>The specimen is almost composed of galena. Galena is pure white in color and consists of tiny grains up to 1 mm in size. Cerussite replaces galena along the cleavage, fractures and around the rim in network form or spot-like (50 to 100μ in width).</p> <p>Cu                      Pb                      Zn                      Ag  70 ppm,                      23.68 %,                      0.04 %,                      62.0 g/t</p>

Sample No.	Field No.	Locality	Rock Name	Reflecting Microscopic Observation
1321	S725	S.T-4	Sphalerite ore	<p>The ore minerals consist of sphalerite, smithsonite, galena, cerussite, pyrite, goethite, and lepidocrocite. Sphalerite (1 mm x 1 mm - 3 mm x 2 mm) dark grey ocher tint in color, is replaced by smithsonite along cleavage and fractures in network and includes lepidocrocite in blab-like. Galena, pure white in color (0.5 mm x 1 mm - 1 mm x 2 mm) is replaced by cerussite along fractures and rim (30<math>\mu</math> to 50<math>\mu</math> in width). Pyrite, creamy yellow in color, is mostly replaced by goethite and lepidocrocite. The cubic or the framboidal pyrite also exists in the finer grains of dolomite (2 to 10<math>\mu</math> in size). Goethite is recognized as the pseudomorph after pyrite of euhedra forming myrmekitic texture with lepidocrocite (30<math>\mu</math> to 80<math>\mu</math> in size).</p> <p style="text-align: center;">Cu            Pb            Zn            Ag 24 ppm,    0.07 %,    0.18 %,    4.0 g/t</p>
1323	S728	S.T-4	Muddy dolostone	<p>The ore minerals are very few, and are only recognized as goethite, pyrite and sphalerite. Goethite, formed pseudomorph after pyrite in cube or framboid up to 50<math>\mu</math> in size, associates with lepidocrocite in myrmekitic texture. Pyrite, creamy yellow in color, is rarely recognized as the remnant of replacement in framboidal form up to 5<math>\mu</math>. Sphalerite is very rare in irregular shape or framboid up to 20<math>\mu</math>.</p>
1340	S757	S.T-8	Dolostone	<p>The ore minerals are recognized as goethite, lepidocrocite, pyrite, and sphalerite. Goethite derived from pyrite associates with lepidocrocite in myrmekitic texture up to 300<math>\mu</math>. Cubes or framboids of pyrite up to 30<math>\mu</math> in size are scattered in the matrix of fine grained dolomite. The larger euhedras of pyrite are mainly replaced by goethite. Sphalerite, darker than goethite in color, is rarely observed filling fractures and pores of dolomite up to 50<math>\mu</math> in size.</p> <p style="text-align: center;">Cu            Pb            Zn 7 ppm,       62 ppm,    17,900 ppm</p>

Sample No.	Field No.	Locality	Rock Name	Reflecting Microscopic Observation
1343	S770	T.T-27	Zebra dolomite	<p>The ore minerals are very few and are mostly recognized as goethite. Goethite is observed as the pseudomorph after pyrite in microsphere and irregular shape. Pyrite is rarely observed as very fine grained framboid or microsphere up to 10<math>\mu</math> in diameter.</p> <p>Cu 2 ppm, Pb 19 ppm, Zn 7 ppm</p>
1350	S779	T.T-26	Dolostone	<p>The ore minerals are very few in this specimen. They are recognized as pyrite and goethite. Pyrite grains in irregular shape up to 10<math>\mu</math> in size are scattered among the dolomite crystals. Goethite, dark grey bluish tint in color, in microsphere of pseudomorph after pyrite up to 10<math>\mu</math> in diameter, also fills open spaces among dolomite crystals.</p> <p>Cu 3 ppm, Pb 25 ppm, Zn 26 ppm</p>
1353	S783	S.T-10	Galena ore	<p>A few galena grains are megascopically observed in the original piece sample. But, in this polished specimen no galena is observed under the microscope. The ore minerals are determined as pyrite, goethite, lepidocrocite, magnetite, sphalerite and smithsonite. Pyrite is mostly replaced by goethite and lepidocrocite. The remnant of replacement i.e. pyrite is scattered in framboidal form up to 5<math>\mu</math>. Goethite and lepidocrocite shows myrmekitic texture in pseudomorph up to 50<math>\mu</math> in size. Magnetite fragments are observed up to 50<math>\mu</math> in size showing harder than sphalerite. Sphalerite, dark grey brownish tint, is almost replaced by smithsonite and hemimorphite (?) up to 150<math>\mu</math> in size. Smithsonite, dark grey near gangue minerals in color, is recognized in lattice form or fracture filling.</p> <p>Cu 48 ppm, Pb 6.56 %, Zn 19.16 %, Ag 16.0 g/t</p>

## A. I-5 Photomicrographs of rocks and ores.

### Thin Section

Sample No.	Field No.	Locality	Geological Unit	Rock Name
971	A770	SR	MI	Quartz porphyry
1007	L712	S.T-2	PU	Dolomitic sandstone
1010	L716	S.T-2	PU	Dolostone
1034	L745	S.T-5	PU	Dolostone
1048	L761	T.T-25	PU	Dolostone
1053	L767	T.T-24	PU	Dolostone
1060	L775	T.T-21	PU	Dolostone
1074	L784	T.T-28	PU	Dolostone with ore
1085	L796	S.T-28	PU	Shaly dolostone
1098	L809	S.T-28	PU	Sandstone
1109	L820	S.T-29	PU	Dolostone
1116	N701	TV	PU	Limestone
1126	N711	HG	PU	Sandstone
1197	N845	T.T-15	PU	Zebra dolomite
1237	P707	TV	PU	Zebra dolomite
1285	P800	HG	PU	Limestone
1314	S714	TV	PU	Oolitic chert
1321	S725	S.T-4	PU	Dolostone with sphalerite
1322	S727	S.T-4	PU	Dolostone
1323	S728	S.T-4	PU	Muddy dolostone
1325	S730	S.T-4	PU	Muddy dolostone
1350	S779	T.T-26	PU	Dolostone
1353	S783	S.T-10	PU	Galena ore

#### Abbreviations

Bit : Bituminous

Gn : Galena

Py : Pyrite

v : vitreous material

cal : calcite

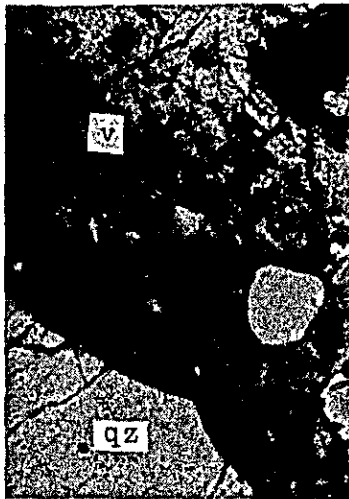
He : Hemimorphite

qz : quartz

dol : dolomite

Pel : Pellet

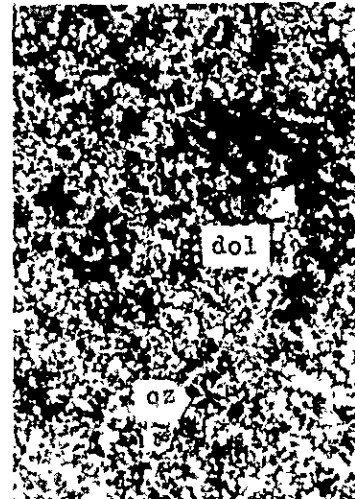
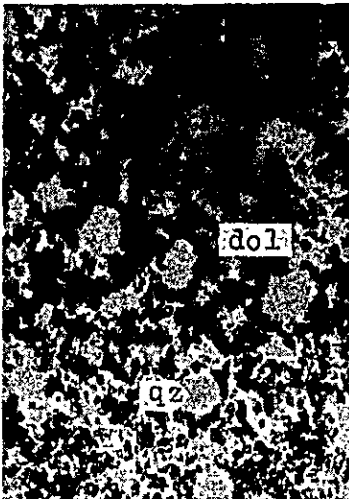
Sp : Sphalerite



Sample No. 971  
 Field No. A770  
 Location SR  
 Geological unit MI  
 Rock name, Quartz porphyry

Left: Open nicol  
 Right: Crossed nicols

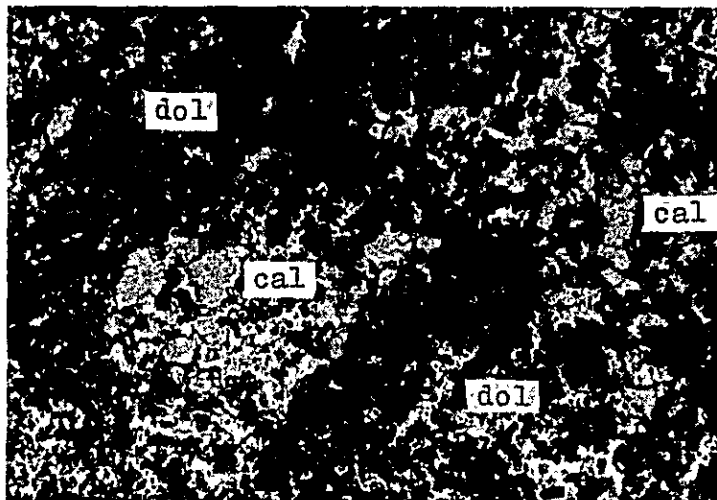
0 0.1 0.2 0.3mm



Sample No. 1007  
 Field No. L712  
 Location S.T-2  
 Geological unit PU  
 Rock name, Dolomitic sandstone

Left: Open nicol  
 Right: Crossed nicols

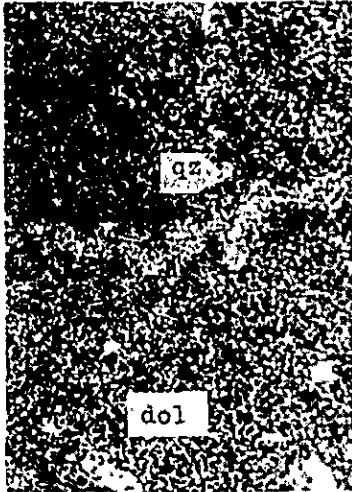
0 0.1 0.2 0.3mm



Sample No. 1010  
 Field No. L716  
 Location S.T-2  
 Geological unit PU  
 Rock name, Dolostone

Open nicol.

0 0.1 0.2 0.3mm



Sample No. 1034  
Field No. L745  
Location S.T-5  
Geological unit PU  
Rock name, Dolostone

Left: Open nicol  
Right: Crossed nicols

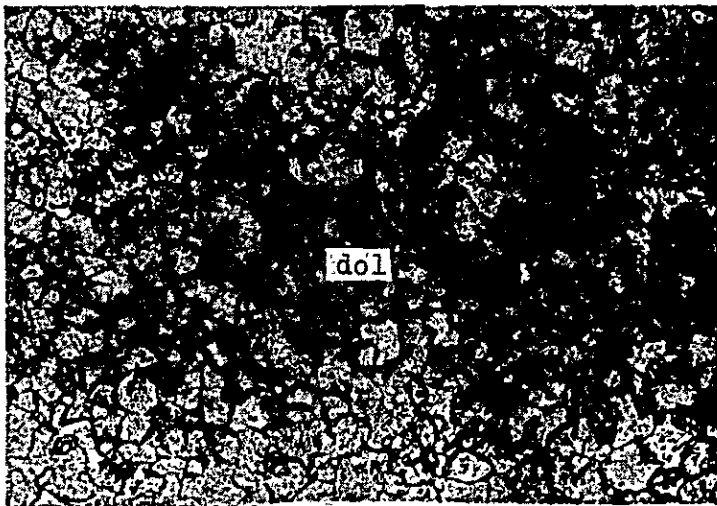
0 0.1 0.2 0.3mm



Sample No. 1048  
Field No. L745  
Location T.T-25  
Geological unit PU  
Rock name, Dolostone

Stained thin section.  
Left: Open nicol  
Right: Crossed nicols

0 0.1 0.2 0.3mm

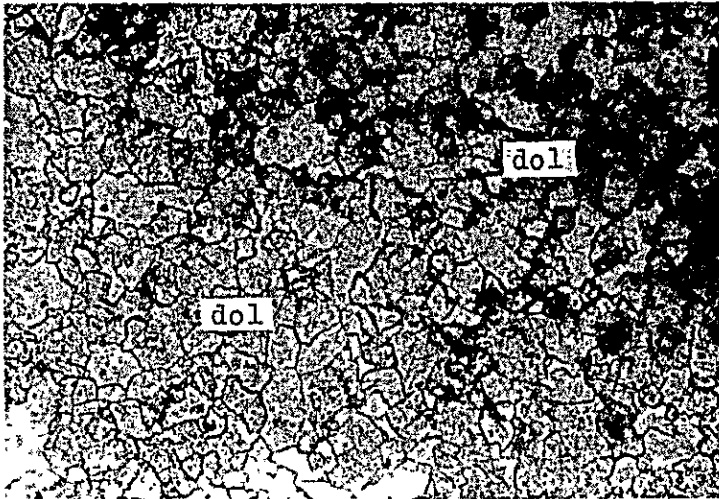


Sample No. 1053  
Field No. L767  
Location T.T-24  
Geological unit PU  
Rock name, Dolostone

Open nicol

0 0.1 0.2 0.3mm

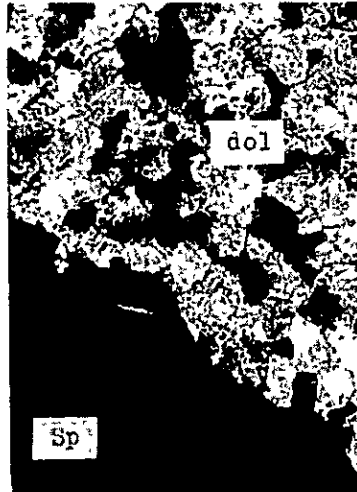
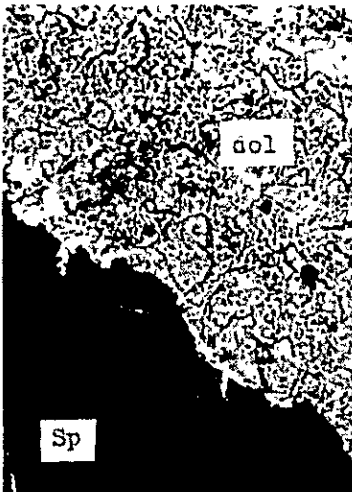




Sample No. 1060  
 Field No. L775  
 Location T.T-21  
 Geological unit PU  
 Rock name, Dolostone

Open nicol

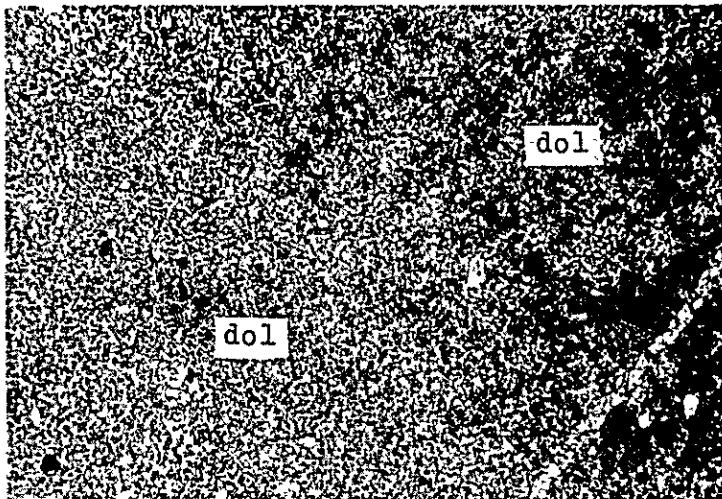
0 0.1 0.2 0.3mm



Sample No. 1074  
 Field No. L784  
 Location T.T-28  
 Geological unit PU  
 Rock name, Dolostone with ore

Left: Open nicol  
 Right: Crossed nicols

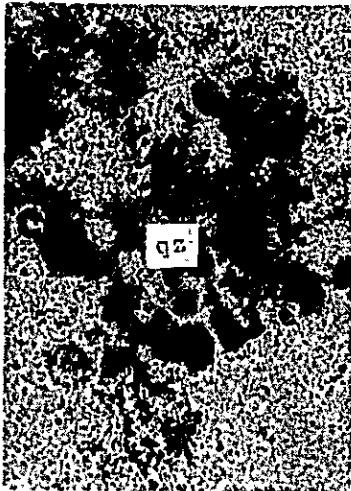
0 0.1 0.2 0.3mm



Sample No. 1085  
 Field No. L796  
 Location S.T-28  
 Geological unit PU  
 Rock name, Shaly dolostone

Open nicol

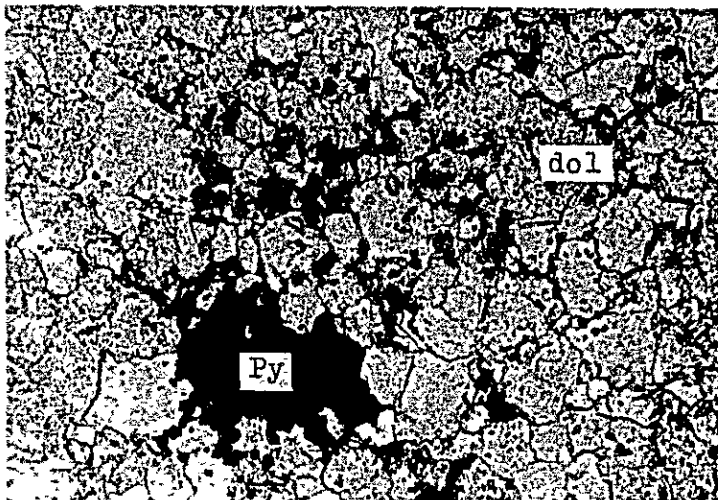
0 0.1 0.2 0.3mm



Sample No. 1098  
 Field No. L809  
 Location S.T-28  
 Geological unit PU  
 Rock name, Sandstone

Left: Open nicol  
 Right: Crossed nicols

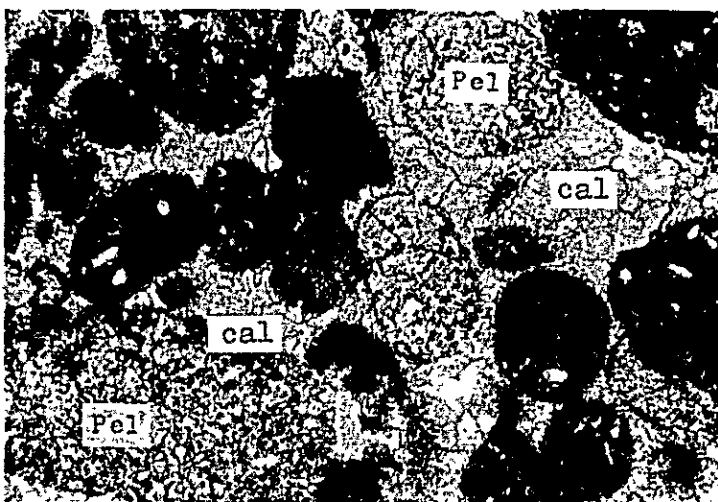
0 0.1 0.2 0.3mm



Sample No. 1109  
 Field No. L820  
 Location S.T-29  
 Geological unit PU  
 Rock name, Dolostone

Open nicol

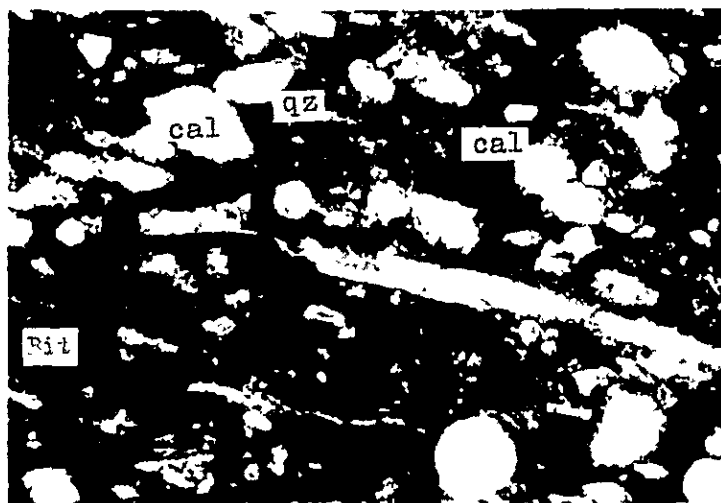
0 0.1 0.2 0.3mm



Sample No. 1116  
 Field No. N701  
 Location TV  
 Geological unit PU  
 Rock name, Limestone

Open nicol

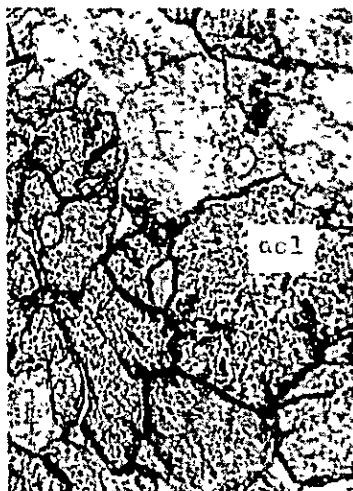
0 0.1 0.2 0.3mm



Sample No. 1126  
 Field No. N711  
 Location HG  
 Geological unit PU  
 Rock name, Sandstone

Open nicol

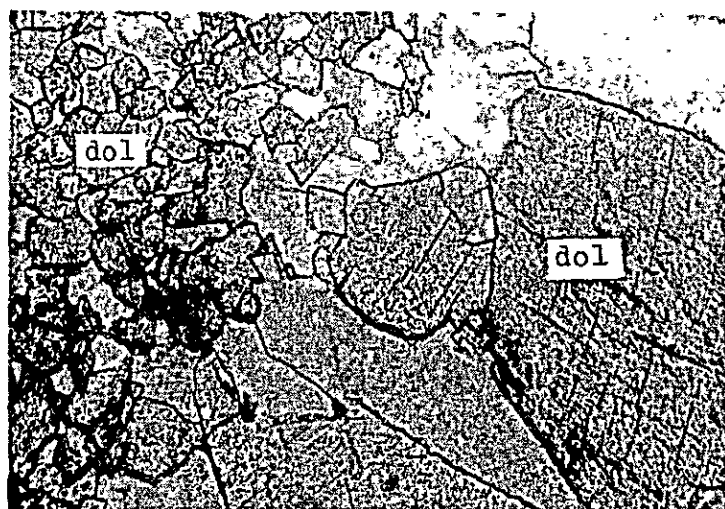
0 0.1 0.2 0.3mm



Sample No. 1197  
 Field No. N845  
 Location T.T-15  
 Geological unit PU  
 Rock name, Zebra Dolomite

Left: Open nicol  
 Right: Crossed nicols

0 0.1 0.2 0.3mm



Sample No. 1237  
 Field No. P707  
 Location TV  
 Geological unit PU  
 Rock name, Zebra Dolomite

Open nicol

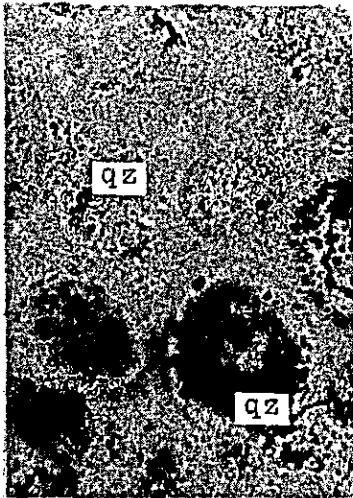
0 0.1 0.2 0.3mm



Sample No. 1285  
 Field No. P800  
 Location HG  
 Geological unit PU  
 Rock name, Limestone

Left: Open nicol  
 Right: Crossed nicols.

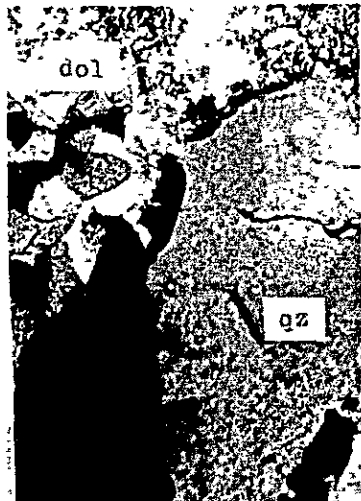
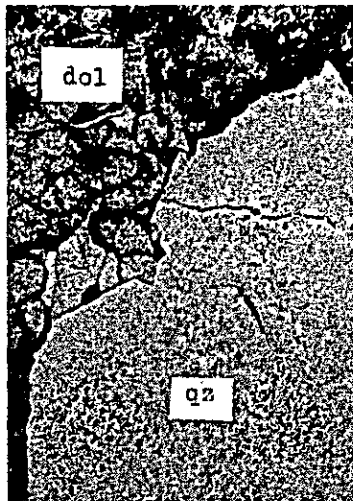
0 0.1 0.2 0.3mm



Sample No. 1314  
 Field No. S714  
 Location TV  
 Geological unit PU  
 Rock name, Oolitic chert

Left: Open nicol  
 Right: Crossed nicols

0 0.1 0.2 0.3mm



Sample No. 1321  
 Field No. S725  
 Location S.T-4  
 Geological unit PU  
 Rock name, Dolostone

Left: Open nicol  
 Right: Crossed nicols

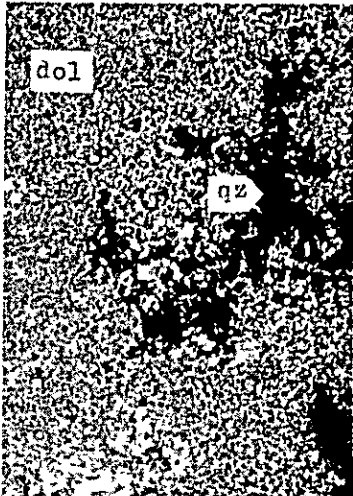
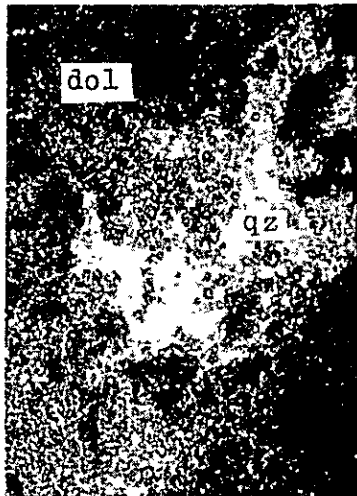
0 0.1 0.2 0.3mm



Sample No. 1321  
 Field No. S725  
 Location S.T-4  
 Geological unit PU  
 Rock name, Dolostone

Left: Open nicol  
 Right: Crossed nicols

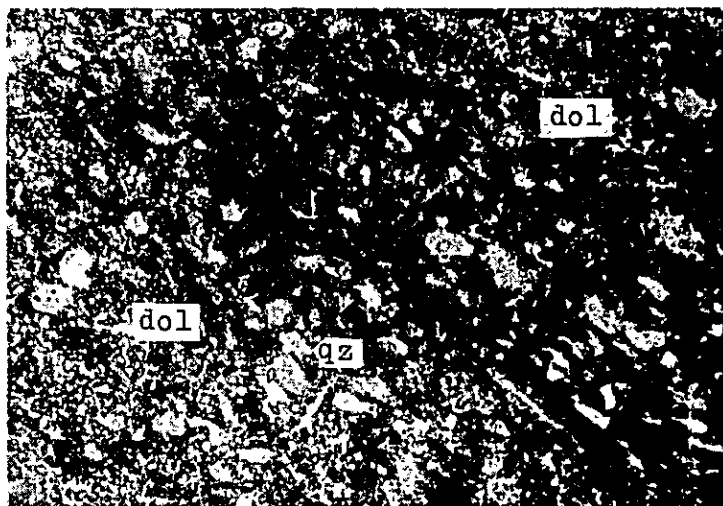
0 0.1 0.2 0.3mm



Sample No. 1322  
 Field No. S727  
 Location S.T-4  
 Geological unit PU  
 Rock name, Dolostone

Left: Open nicol  
 Right: Crossed nicols

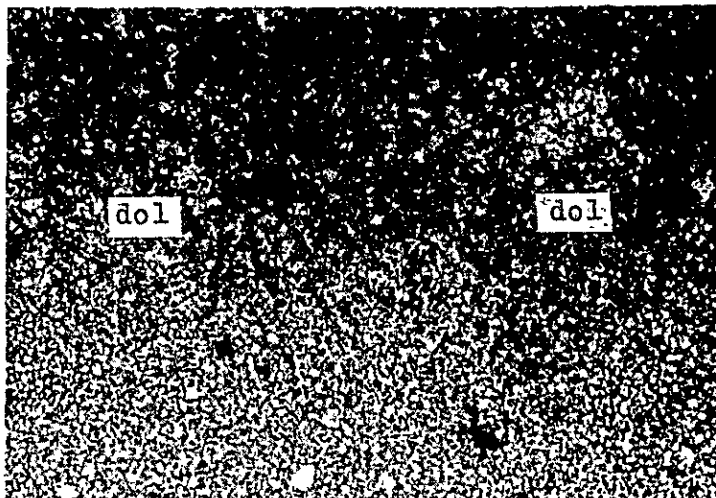
0 0.1 0.2 0.3mm



Sample No. 1323  
 Field No. S728  
 Location S.T-4  
 Geological unit PU  
 Rock name, Muddy dolostone

Open nicol

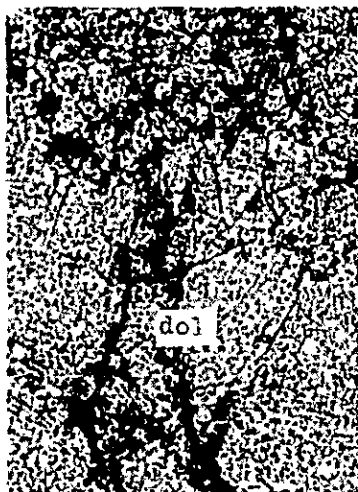
0 0.1 0.2 0.3mm



Sample No. 1325  
 Field No. S730  
 Location S.T-4  
 Geological unit PU  
 Rock name, Muddy dolostone

Open nicol

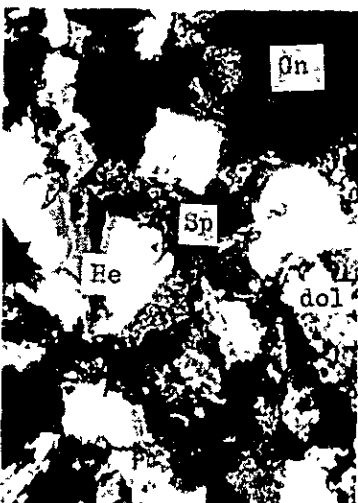
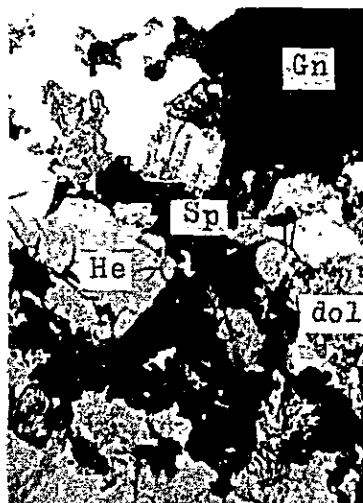
0 0.1 0.2 0.3mm



Sample No. 1350  
 Field No. S779  
 Location T.T-26  
 Geological unit PU  
 Rock name, Dolostone

Left: Open nicol  
 Right: Crossed nicols

0 0.1 0.2 0.3mm



Sample No. 1353  
 Field No. S783  
 Location S.T-10  
 Geological unit PU  
 Rock name, Dolostone with ore.

Left: Open nicol  
 Right: Crossed nicols

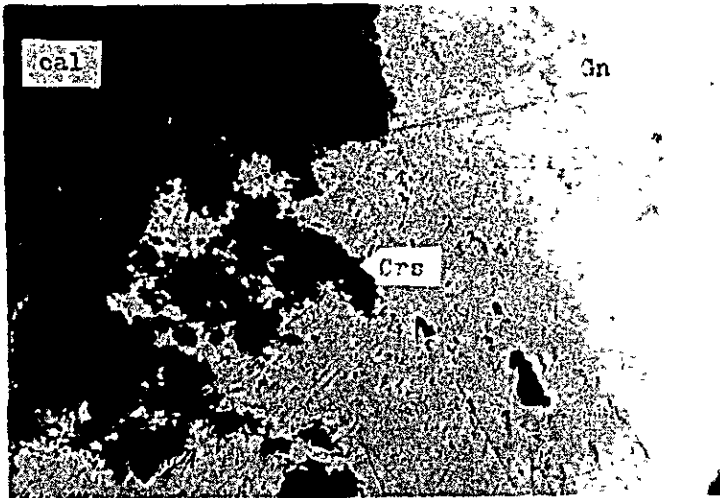
0 0.1 0.2 0.3mm

Polished Section

Sample No.	Field No.	Locality	Rock Name
954	A752	HG	Galena ore
1022	L729	S.T-2	Dolostone
1047	L760	T.T-25	Dolostone
1068	L783	S.T-28	Sphalerite Galena ore
1074	L784	S.T-28	Sphalerite Galena ore
1109	L820	S.T-29	Dolostone
1259	P754	GG	Limestone
1285	P800	HG	Limestone
1321	S725	S.T-4	Sphalerite ore
1323	S728	S.T-4	Muddy dolostone

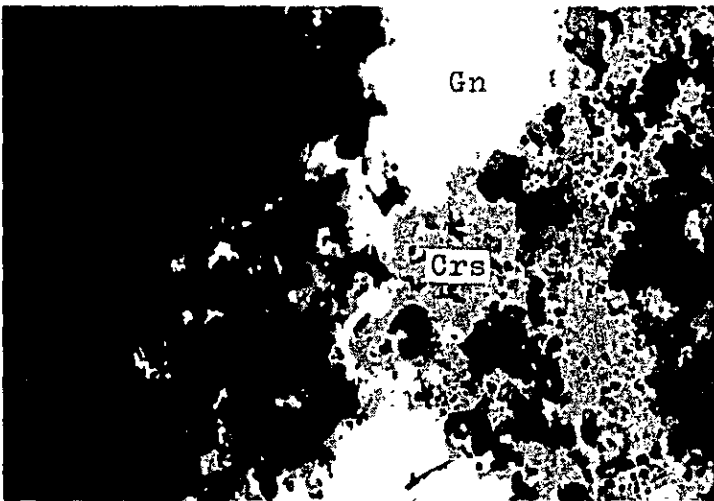
Abbreviations

cal : calcite	Crs : Cerussite	dol : dolomite
Ge : Goethite	Gn : Galena	Py : Pyrite
qz : quartz	Sm : Smithsonite	Sp : Sphalerite



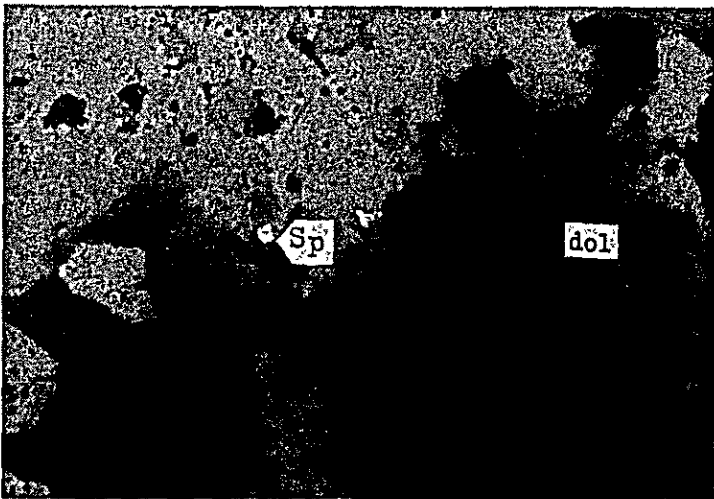
Sample No. 954  
Field No. A752  
Location HG  
Rock name,  
Galena ore.

0 0.1 0.2 0.3mm



Sample No. 1022  
Field No. L729  
Location S.T-2  
Rock name,  
Dolostone

0 0.1 0.2 0.3mm



Sample No. 1047  
Field No. L760  
Location T.T-25  
Rock name,  
Dolostone

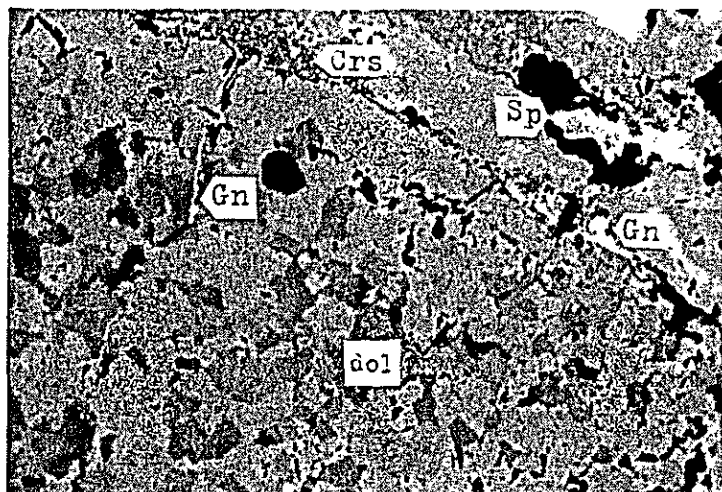
0 0.1 0.2 0.3mm





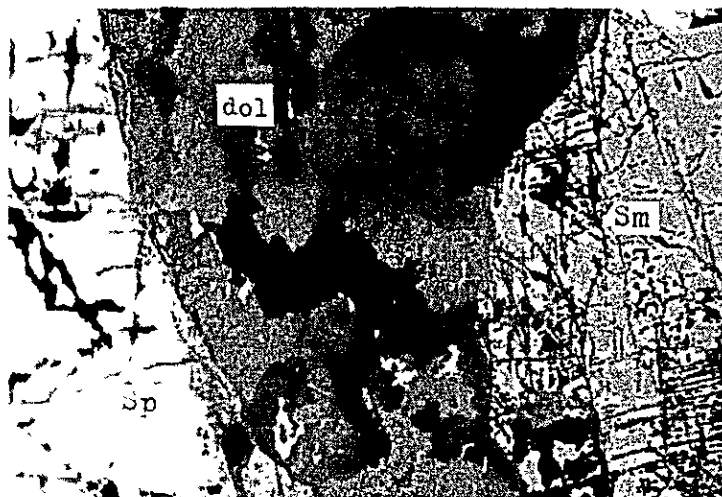
Sample No. 1068  
 Field No. L783  
 Location S.T-28  
 Rock name,  
 Sphalerite, Galena ore

0 0.1 0.2 0.3mm



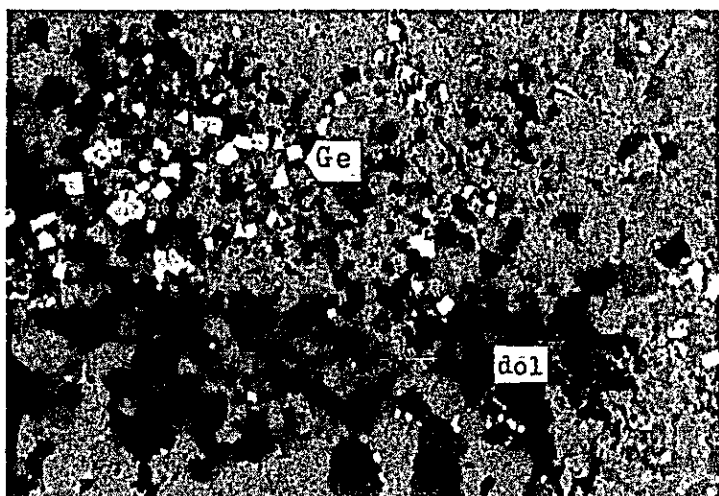
Sample No. 1068  
 Field No. L783  
 Location S.T-28  
 Rock Name,  
 Dolostone with ore.

0 0.1 0.2 0.3mm



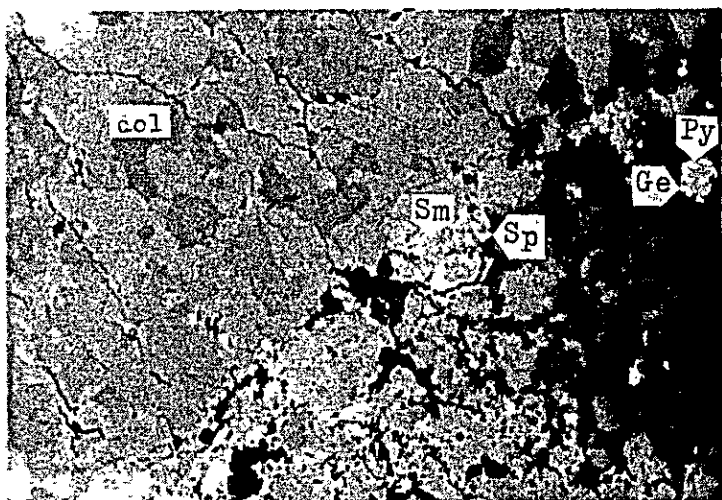
Sample No. 1068  
 Field No. L783  
 Location S.T-28  
 Rock name,  
 Dolostone with ore.

0 0.1 0.2 0.3mm



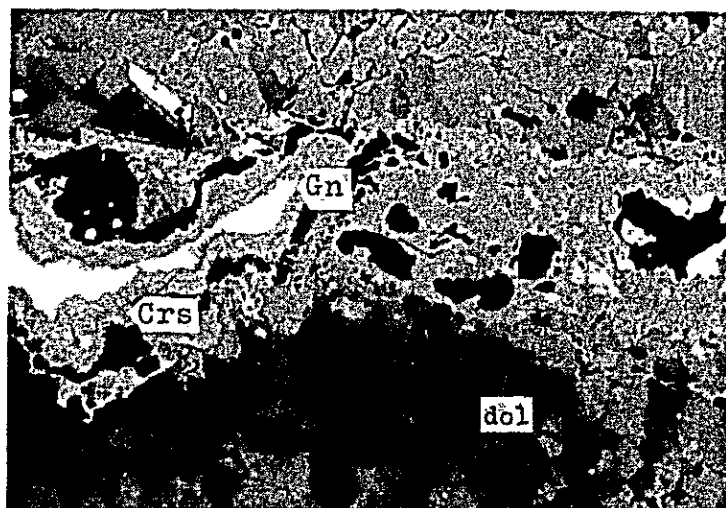
Sample No. 1068  
 Field No. L783  
 Location S.T-28  
 Rock name,  
 Dolostone with ore.

0 0.1 0.2 0.3mm



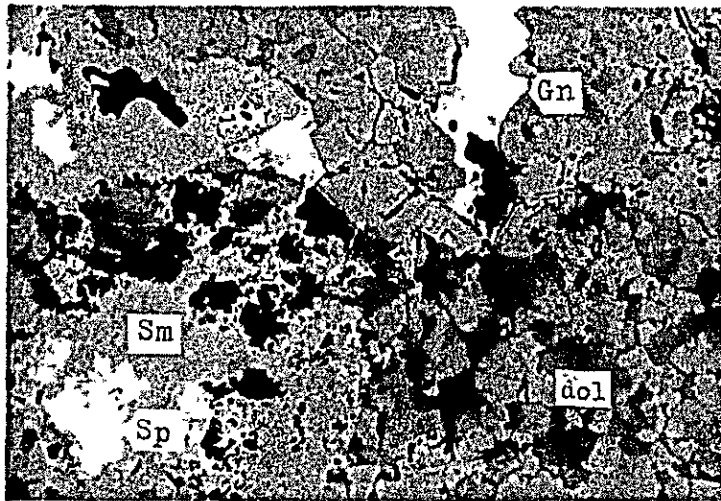
Sample No. 1068  
 Field No. L783  
 Location S.T-28  
 Rock name,  
 Dolostone with ore.

0 0.1 0.2 0.3mm



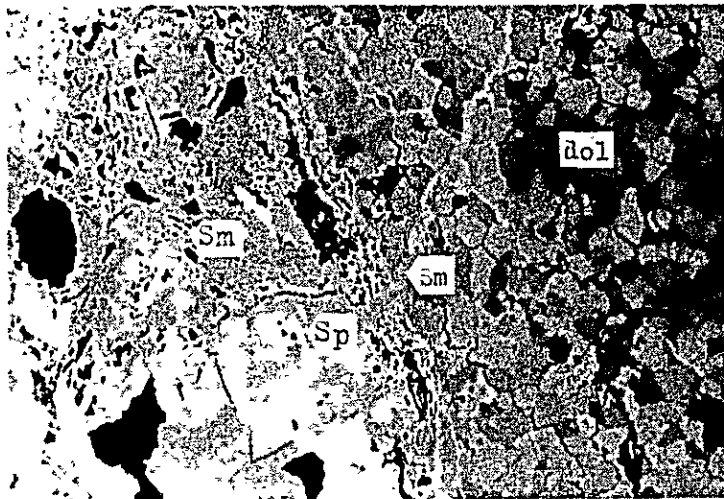
Sample No. 1068  
 Field No. L783  
 Location S.T-28  
 Rock name,  
 Dolostone with ore.

0 0.1 0.2 0.3mm



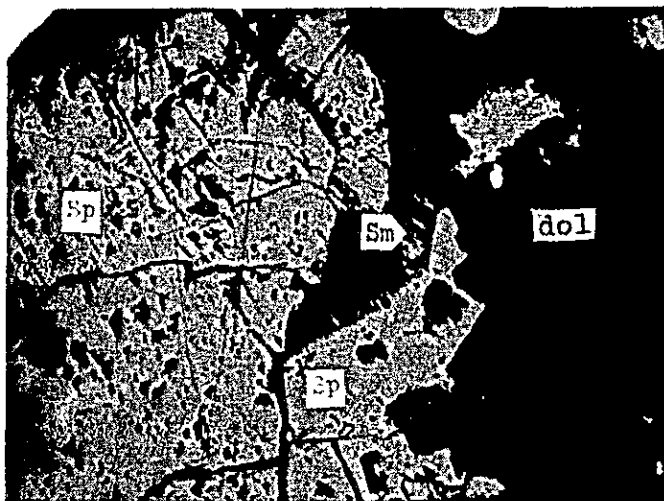
Sample No. 1068  
 Field No. L783  
 Location S.T-28  
 Rock name,  
 Dolostone with ore.

0 0.1 0.2 0.3mm



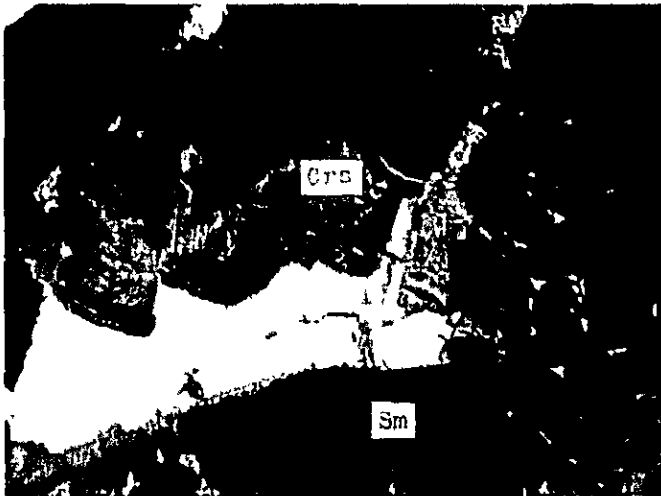
Sample No. 1068  
 Field No. L783  
 Location S.T-28  
 Rock name,  
 Dolostone with ore.

0 0.1 0.2 0.3mm



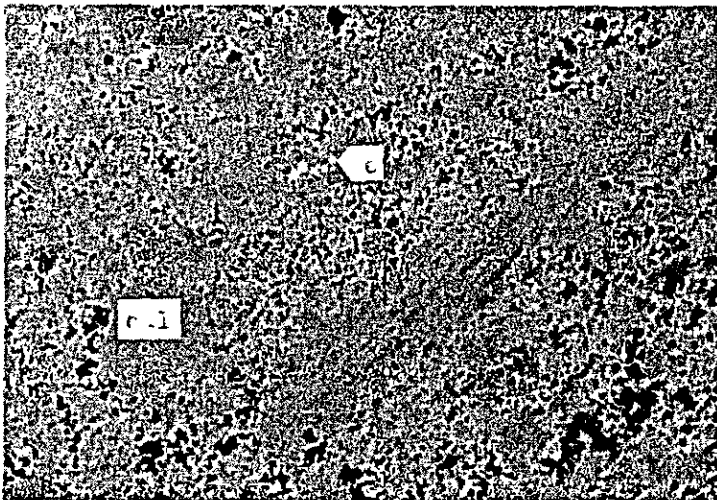
Sample No. 1074  
 Field No. L784  
 Location S.T-28  
 Rock name,  
 Dolostone with ore.

0 0.1mm



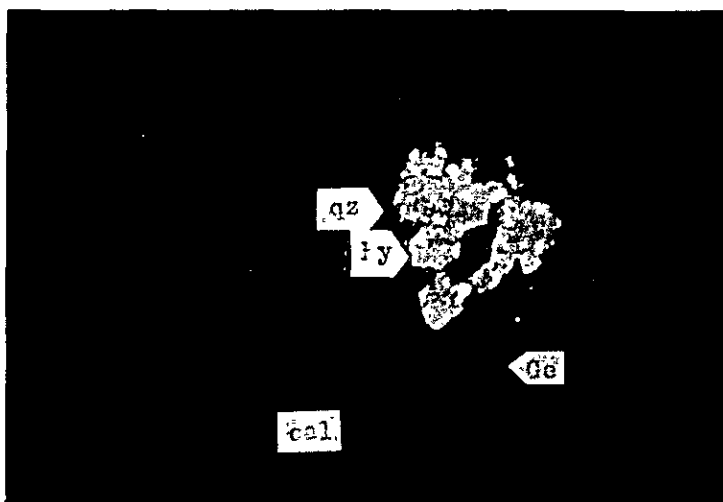
Sample No. 1109  
Field No. L820  
Location S.T-29  
Rock name,  
Galena ore.

0 ——— 0.1mm



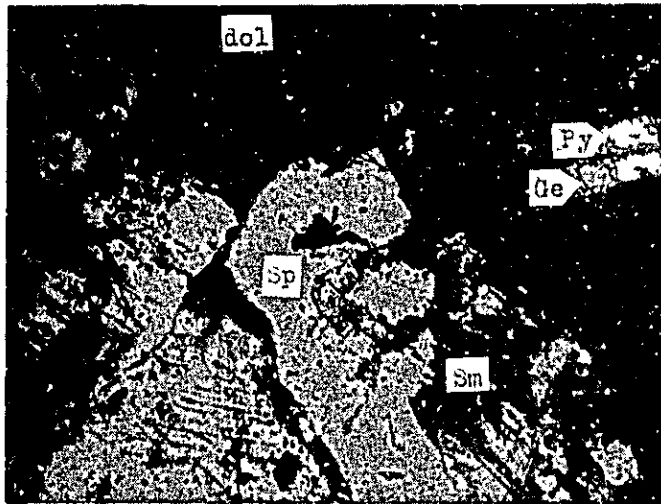
Sample No. 1259  
Field No. P754  
Location GG  
Rock name,  
Limestone

0 ——— 0.1mm



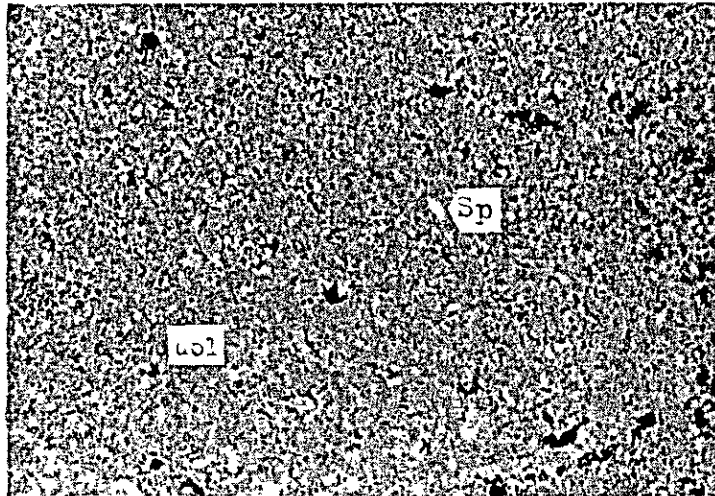
Sample No. 1285  
Field No. P800  
Location HG  
Rock name,  
Limestone

0 ——— 0.1mm



Sample No. 1321  
Field No. S725  
Location S.T-4  
Rock name,  
Dolostone with ore.

0 0.1mm



Sample No. 1323  
Field No. S728  
Location S.T-4  
Rock name,  
Muddy dolostone with ore.

0 0.1 0.2 0.3mm

A. I-6 Chemical composition of ore samples.

Sample No.	Field No.	Analysis			
		Cu(ppm)	Pb(%)	Zn(%)	Ag(g/t)
954	A752	8	25.80	0.11	74.0
1022	L729	10	0.09	0.35	8.0
1023	L730	30	0.75	0.05	10.0
1024	L731	10	77.30	0.02	40.0
1068	L783	24	0.15	20.72	24.0
1069	L783-1	14	2.30	2.22	6.0
1070	L783-2	10	0.62	1.92	6.0
1071	L783-3	20	1.08	2.48	8.0
1072	L783-4	28	0.09	1.83	4.0
1073	L783-5	14	0.24	3.30	6.0
1099	L810	7	0.10	0.27	7.9
1100	L811	40	0.01	0.04	10.6
1101	L812	6	0.01	0.03	9.1
1102	L813	7	0.02	0.28	8.9
1103	L814	5	0.02	0.05	7.0
1104	L815	8	2.11	11.06	17.0
1105	L816	28	0.09	11.17	23.3
1106	L817	9	2.53	2.36	8.9
1107	L818	6	0.01	0.09	44.5
1108	L819	17	0.13	4.59	10.0
1109	L820	8	0.16	10.74	23.5
1110	L821	8	0.08	3.14	8.2
1111	L822	14	0.10	0.21	4.3
1112	L823	10	0.06	0.11	4.2
1113	L824	13	0.09	0.26	3.9
1114	L825	33	0.13	0.34	4.1

Sample No.	Field No.	Analysis			
		Cu(ppm)	Pb(%)	Zn(%)	Ag(g/t)
1115	L826	19	0.11	0.38	4.4
1148	N746	20	4.33	0.01	18.0
1289	P807	70	23.68	0.04	62.0
1321	S725	24	0.07	0.18	4.0
1353	S783	48	6.56	19.16	16.0

A. I-7 List of fossils.

Sample No.	Location	Stratigraphical Units	Fossils	Estimated Age	Remarks
A746	Gungapa	Pucara Group	Echinoid spine	Jurassic	Echinoid
A759	Huarao G.	Pucara Group	Echinoid fragments and spine Bivalves, Calcareous sponge	Jurassic	Echinoid Bivalves
A766	Huarao G.	Pucara Group	Echinoid fragments	Jurassic	Echinoid
D - 1	Huarao G.	Pucara Group	Psiloceras reissi Tilmann Pentacrinitis jurensis (Quenstedt)	Jurassic, Hettangian Jurassic	Ammonite Crinoids stem
D - 2	Tambo de Vaca	Pucara Group	Rhynchonella sp.	Jurassic, Lias	Brachiopods
D - 3	Tambo de Vaca	Pucara Group	Pentacrinites jurensis (Quenstedt)	Jurassic, Lias	Crinoids stem
D - 5	Tambo de Vaca	Pucara Group	Vermiceras stubeli Tilmann	Jurassic, Sinemurian	Ammonite
D - 6	Tambo de Vaca	Pucara Group	Arnioceras ceratitoides (Quenstedt)	Jurassic, Sinemurian	Ammonite
D - 7	Tambo de Vaca	Pucara Group	Arnioceras Angustiocastatus Tilmann	Jurassic, Sinemurian	Ammonite
P - 1	Tambo de Vaca	Pucara Group	Rhynchonella sp. Cyclostomata ind.	Jurassic, Lias Jurassic, Lias	Brachiopods Bryozoan
P - 7	Tambo de Vaca	Pucara Group	Arnioceras sp.	Jurassic, Sinemurian	Ammonite



Sample No.	Location	Stratigraphical Units	Fossils	Estimated Age	Remarks
L704	S. T-14	Pucara Group	Pecten ? sp.	Jurassic, Lias	Bivalves
L728	S. T-2	Pucara Group	Gastropods (silicified)	Jurassic	Gastropods
L748	S. T-5	Pucara Group	Pteridae Gen. et sp. indet. Ccarditidae Gen. et sp. indet. Pectinidae Gen. et sp. indet.	Jurassic	Bivalves
N724	Tambo de Vaca	Pucara Group	Not identified	Jurassic	-
N728	Tambo de Vaca	Pucara Group	Not identified	Jurassic	-
N752	Tambo de Vaca	Pucara Group	Rimirhynchia rimosiformis Buckman Pentacrinites jurensis (Quenstedt)	Jurassic, Lias med ? Jurassic, Lias med ?	Brachiopods Crinoids
N759	Huarao G.	Pucara Group	Psiloceras reissi Tilmann	Jurassic, Hettangian	Ammonite
N768	Tambo de Vaca	Pucara Group	Vermiceras stubeli Tilmann	Jurassic, Sinemurian	Ammonite
P705	Tambo de Vaca	Pucara Group	Porifera ind.	Jurassic, Lias med ?	Porifera
P710	Tambo de Vaca	Pucara Group	Rhynchonella tetraedra Sow. Rhynchonella Wanneri Tilmann	Jurassic, Sinemurian Jurassic, Sinemurian	Brachiopods Brachiopods
P712	Tambo de Vaca	Pucara Group	Not identified	Jurassic	-

Sample No.	Location	Stratigraphical Units	Fossils	Estimated Age	Remarks
S712	Tambo de Vaca	Pucara Group	Arnioceras ceratitoides (Quenstedt)	Jurassic, Sinemurian	Ammonite
S783	S.T-10	Pucara Group	Not identified	Jurassic	-

A. I-8 Photographs of fossils.

Plate 1

- Fig. 1 Dolomitized oolitic limestone with echinoid spine, A-746.
- Fig. 2 Distinctly dolomitized limestone with echinoid fragments,  
A-766.
- Figs. 3, 4. Slightly dolomitized oobiosparite with echinoid fragments and  
spine (fig. 3), bivalves and calcareous sponge (fig. 4), A-759.
- Figs. 5, 6. Nodular chert with distinctly silicefied gastropods, L-728.
- Fig. 7 Calcareous silt stone with fragmental shell of bivalves, L-748.
- Fig. 8 Oolitic limestone, N-724.

All figs. x 5.

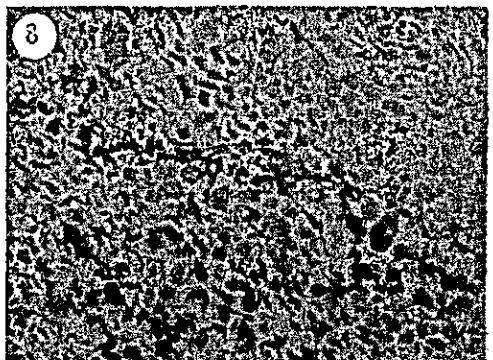
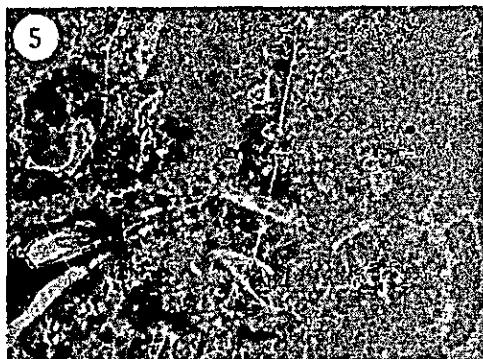
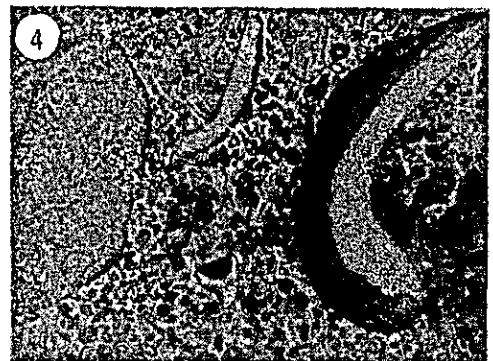
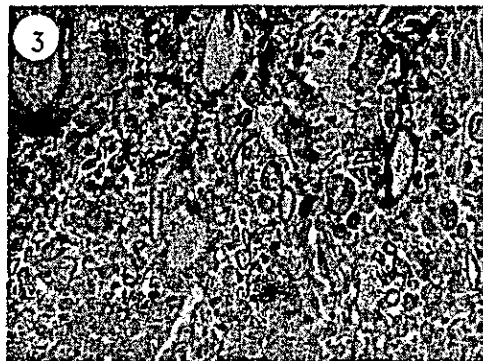
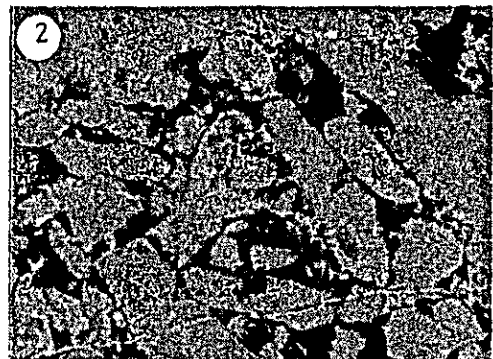
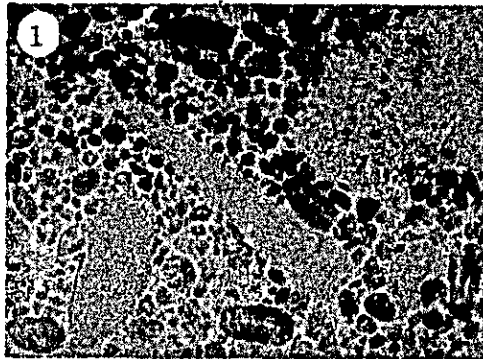


Plate 2

Figs. 1~5. Pteriidae Gen. et Sp. indet.

figs. 1, 2. More or less deformed right valves, L-748 c, d-1, x 5.5.

fig. 3. Fragmental right valve, L-748 e, x 6.7.

fig. 4. A right valve of small specimen, L-748 d-2, x 5.5.

fig. 5. Internal side view of a fragmental left valve, L-748 a,  
x 5.5.

Fig. 6. Ccarditidae Gen. et Sp. indet.

A small left valve, L-748 e, x 6.7.

Fig. 7. Pectinidae Gen. et Sp. indet.

A small left valve, L-748 b, x 5.5.

Fig. 8. Bivalve Gen. et Sp. indet.

L-728, x 2.

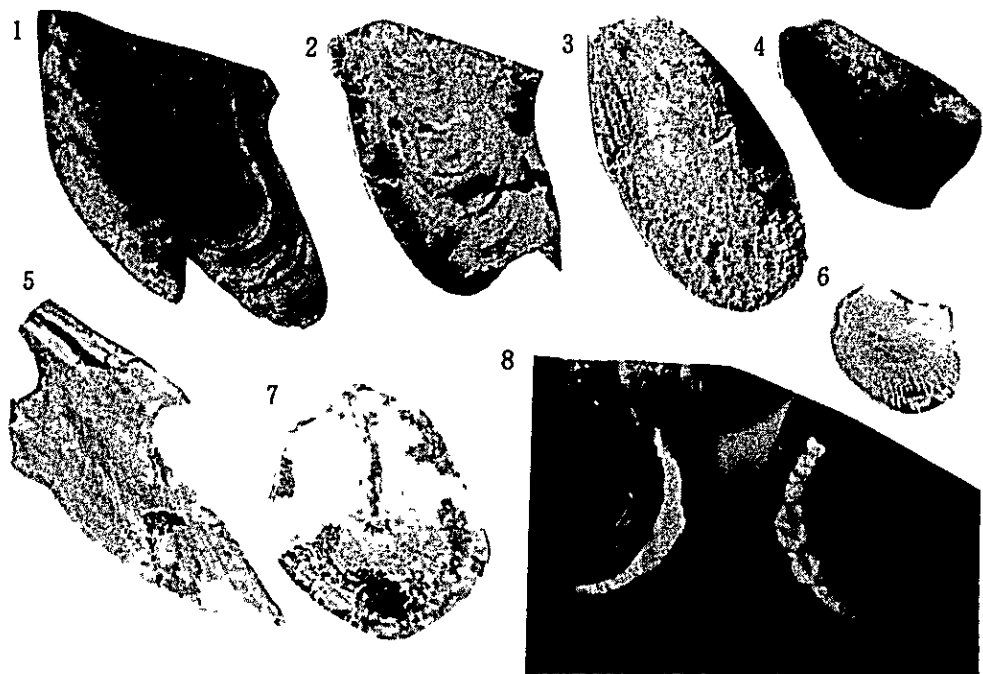


Plate 3

- Fig. 1. Not identified  
P-712, 1397, x 0.85.
- Fig. 2. Arnioceras ceratitoides (Quenstedt), identified by Ing. Carlos Rangel, S-712, 1386, x 0.55.
- Fig. 3. Cyclostomata Gen. et Sp. indet. by Ing. Carlos Rangel, P-1, 1395, x 4.
- Fig. 4. Rimirhynchia cf. rimosiformis, identified by Ing. Carlos Rangel, N-752, 1393, x 3.5.
- Fig. 5. Rhynchonellidae Gen. et Sp. indet., P-710, 1392, x 4.
- Figs. 6, 7. Rhynchonella sp., identified by Ing. Carlos Rangel, P-1, 1395, x 4.



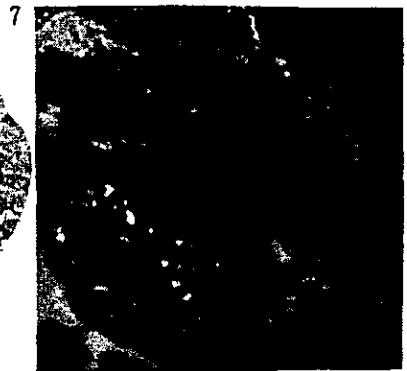
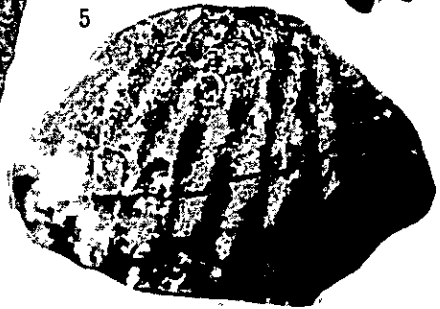
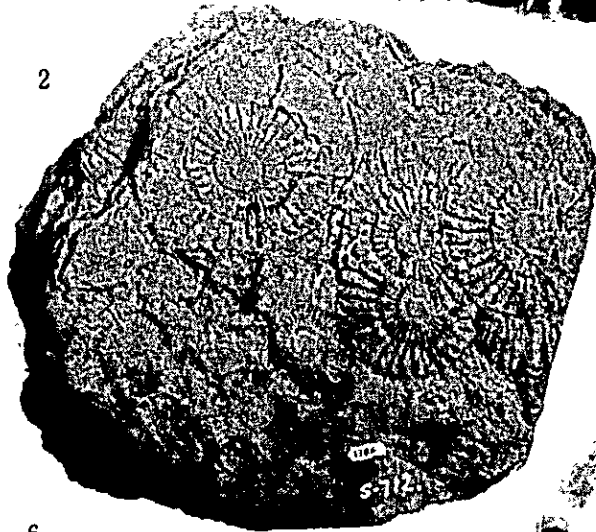


Plate 4

Figs. 1-6. Rhynchonellidae Gen. et Sp. indet. P710

figs. 1a, b. Pedicle and brachial valves of a single specimen,  
1392-2, x 4.

figs. 2a, b. Brachial and pedicle valves of an another specimen,  
1392-1, x 4.

figs. 3-6. Brachial valves, x 3.5.

Fig. 7. Not identified  
P-712, 1397, x 1.

Fig. 8. Arnioceras ceratitoides (Quenstedt), identified by Ing. Carlos  
Rangel, S-712, 1386, x 0.8.

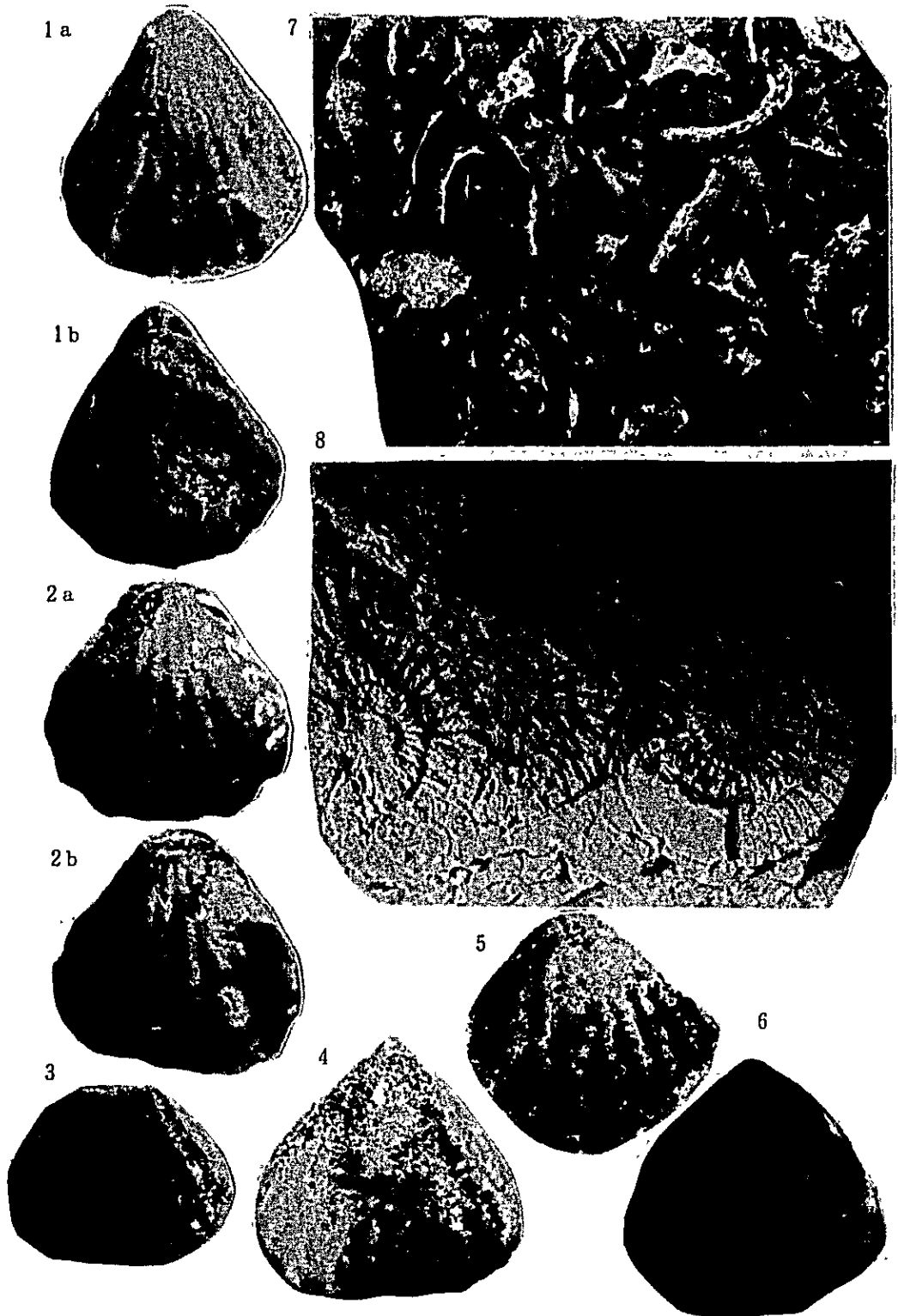
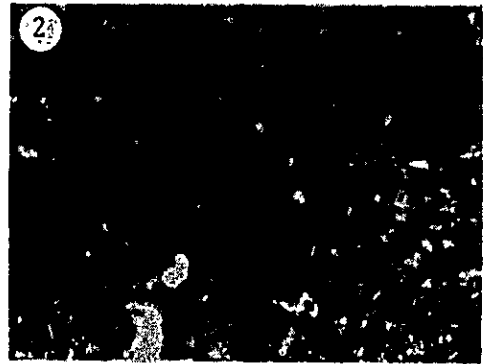


Plate 5

Fig. 1. Slightly dolomitized oolitic limestone, N-728. x 5.

Fig. 2. Recrystallized calcareous sandstone, S-783. x 5.



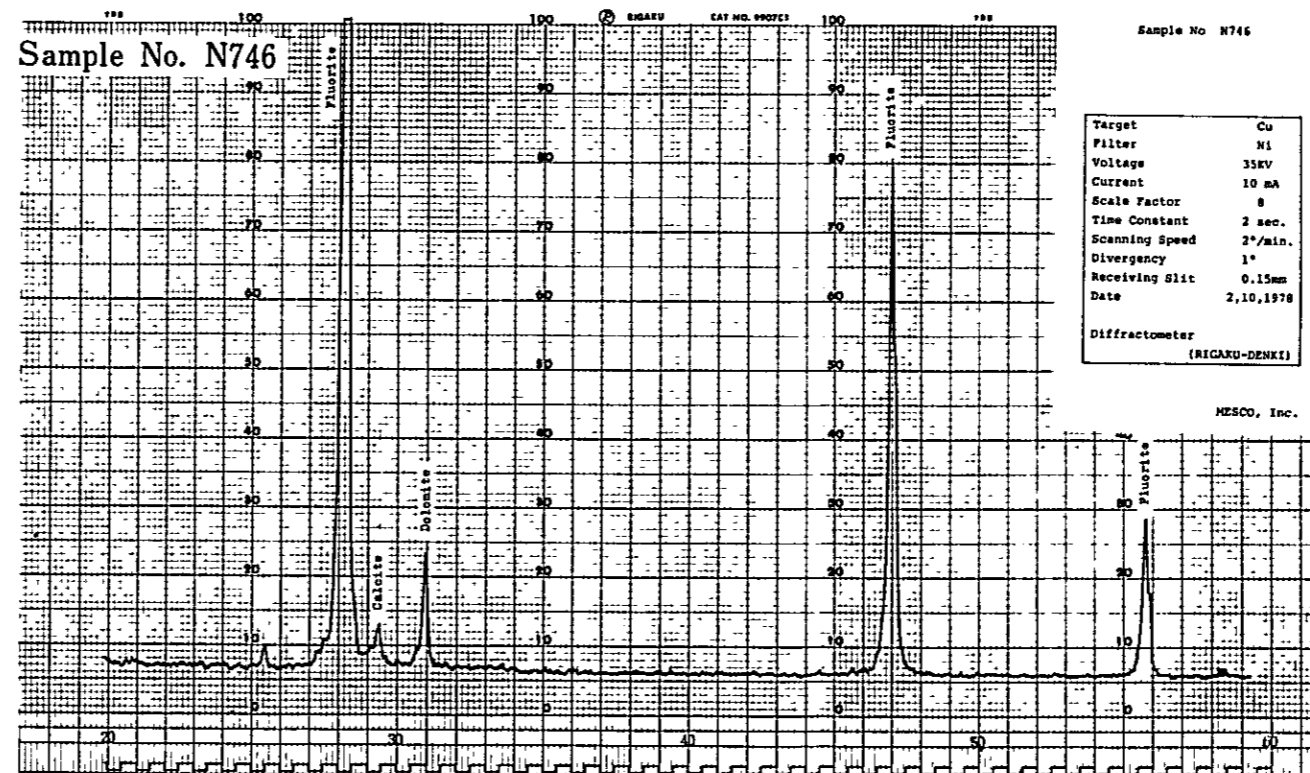
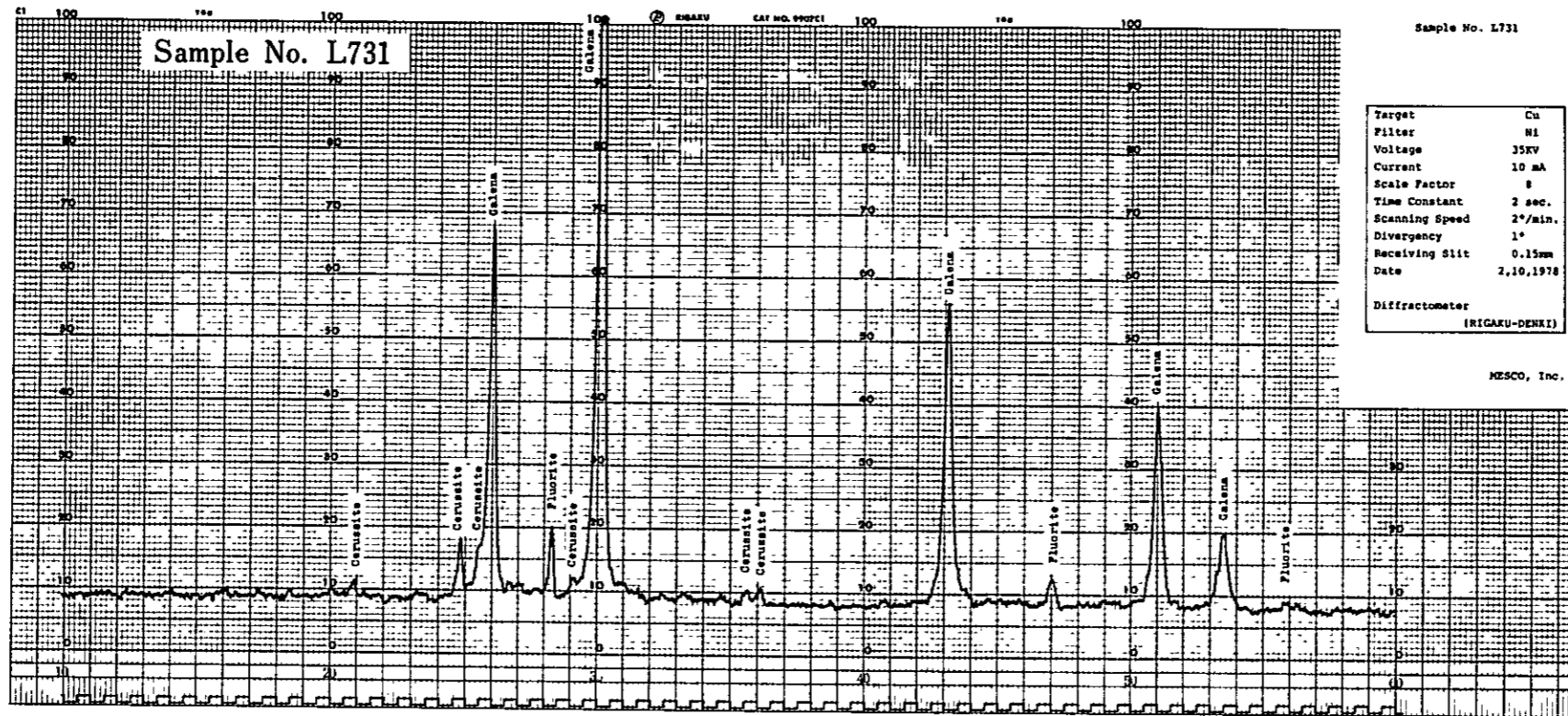
**A. I-9 Results of X-ray diffraction test.**

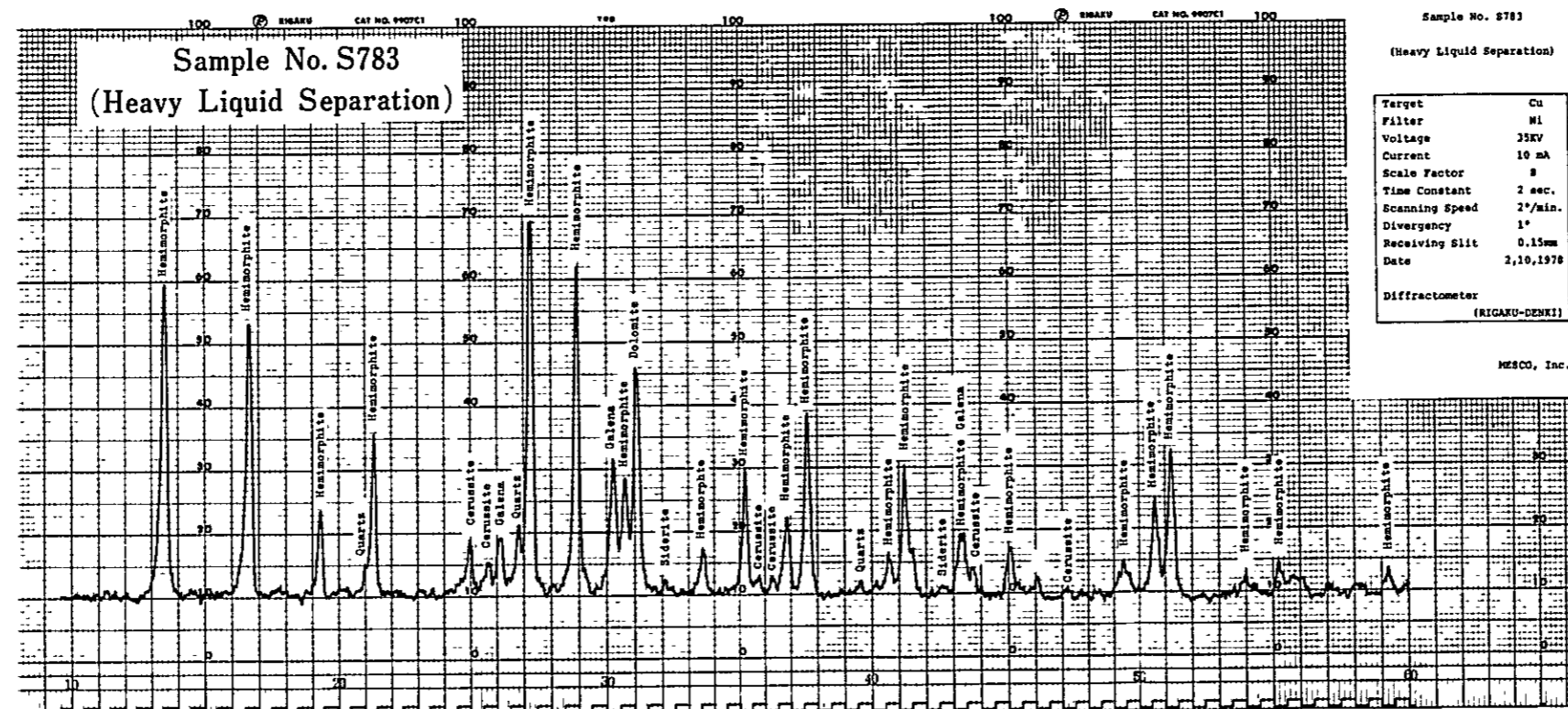
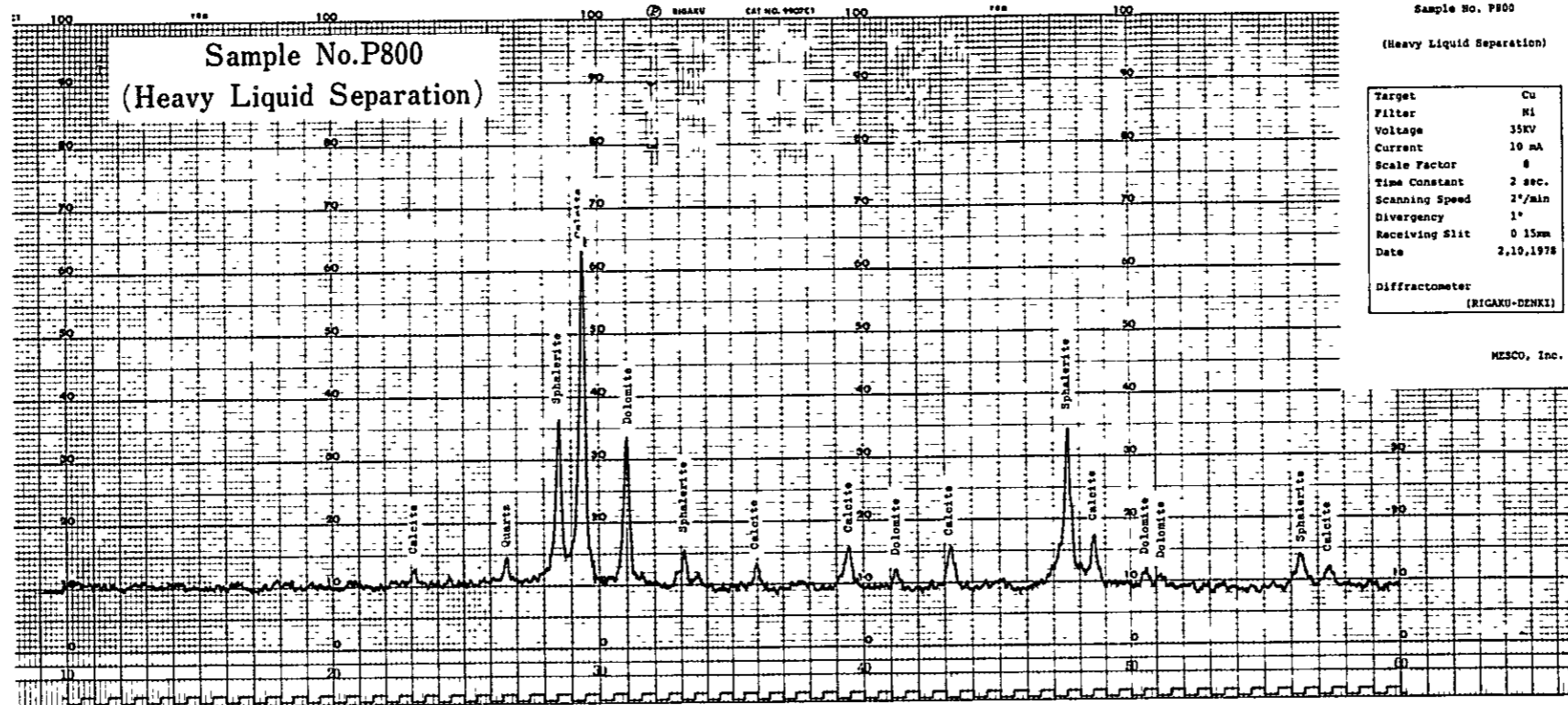
- ⊙ Very abundant
- ⊙ Abundant
- Common
- Rare
- Very rare

Sample No.	Minerals		Dolomite	Calcite	Quartz	Fluorite	Galena	Cerussite	Sphalerite	Hemimorphite	Siderite	
	Field No.											
1024	L731						⊙	○				
1148	N746	⊙	○			○						
1190	N833	⊙	○	•								
1193	N838	⊙	•									
1197	N845	⊙										
1200	N849	⊙		○								
1285	P800	⊙	•					○				heavy liquid separation
1321	P725	○	○					⊙				" "
1340	S757	⊙	○	○				○	○			" "
1353	S783	○		○		○	○		⊙	○		" "

**A. I-10 Charts of X-ray diffraction test.**







A. I-11 Results of X-ray microanalysis.

Plate 1.



Absorbed electron image



Fe X-ray image

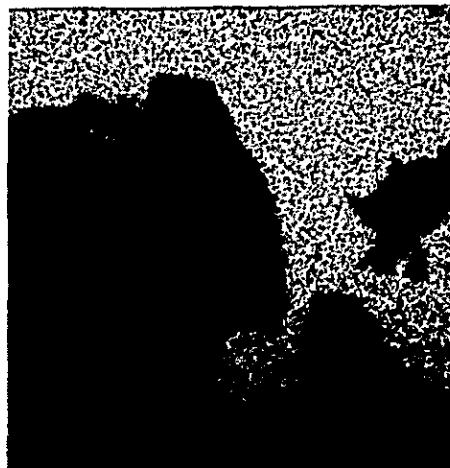
330  $\mu$



Zn X-ray image



S X-ray image



Ca X-ray image



Mg X-ray image

Sample No. L-784-①  
Accelerating voltage: 25KV  
Absorbed electron current: 0.2 $\mu$ A  
Magnification: X300

Plate 2.



Absorbed electron image



Fe X-ray image

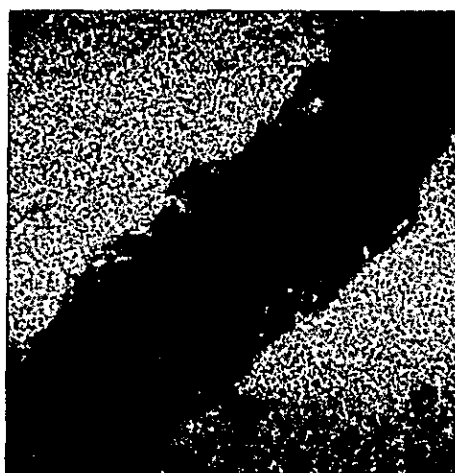
↑  
330 μ  
↓



Zn X-ray image



S X-ray image



Ca X-ray image



Mg X-ray image

Sample No. L784-②  
Accelerating voltage: 25KV  
Absorbed electron current: 0.2μA  
Magnification: X300

Plate 3.



Absorbed electron image



Pb X-ray image



Zn X-ray image



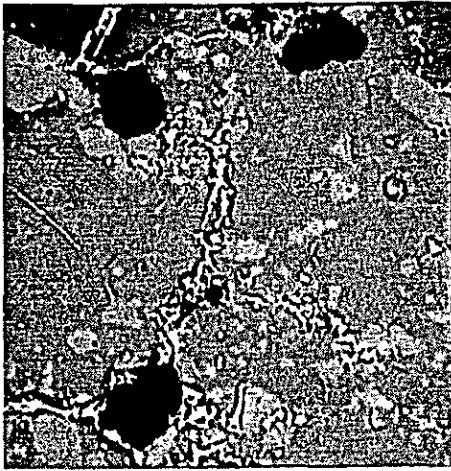
S X-ray image



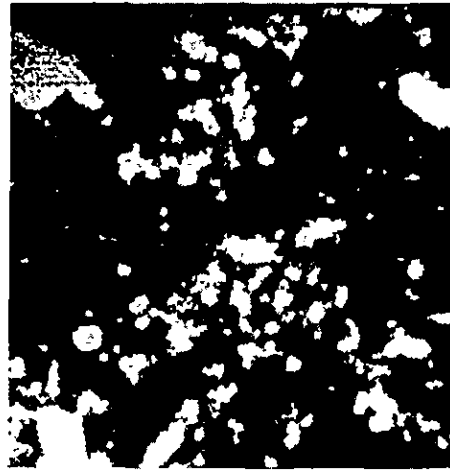
Si X-ray image

Sample No. L820  
Accelerating voltage: 25KV  
Absorbed electron current: 0.2μA  
Magnification: X300

Plate 4.

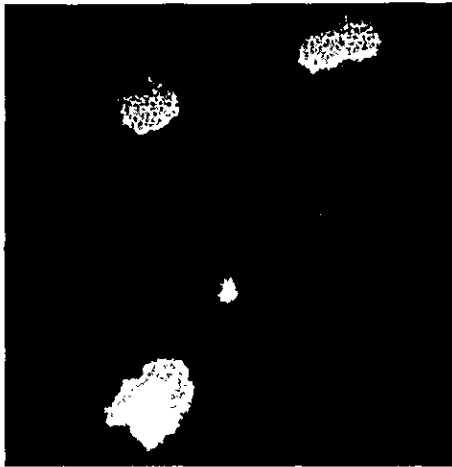


Absorbed electron image

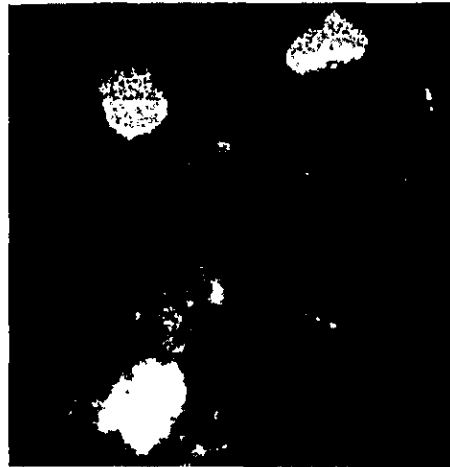


Si X-ray image

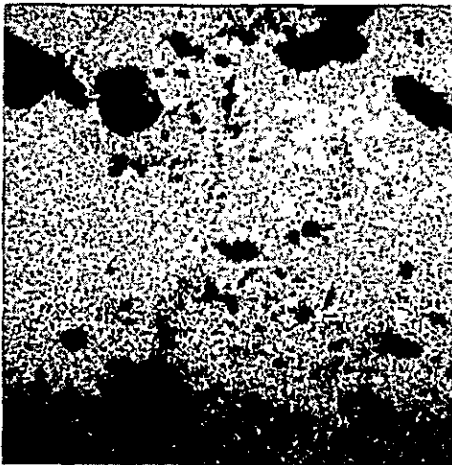
330  $\mu$



Zn X-ray image



S X-ray image



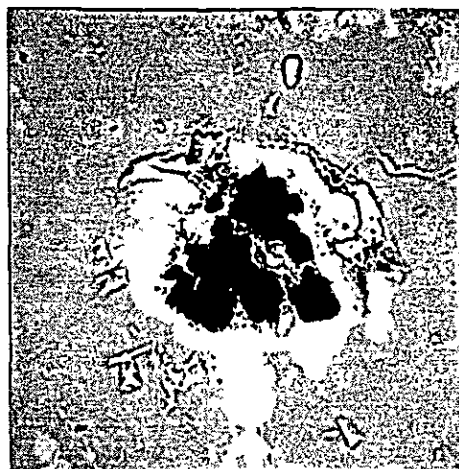
Ca X-ray image



Mg X-ray image

Sample No. P800-①  
Accelerating voltage: 25KV  
Absorbed electron current: 0.2 $\mu$ A  
Magnification: X300

Plate 5.

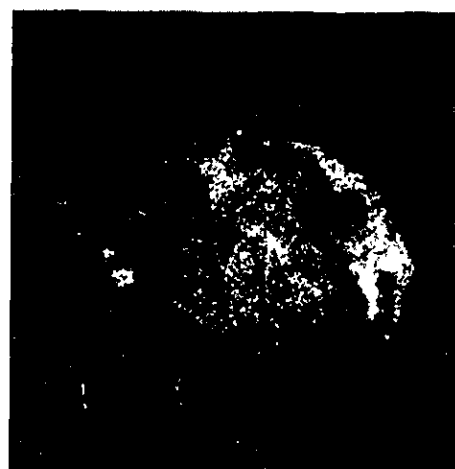


Absorbed electron image



Fe X-ray image

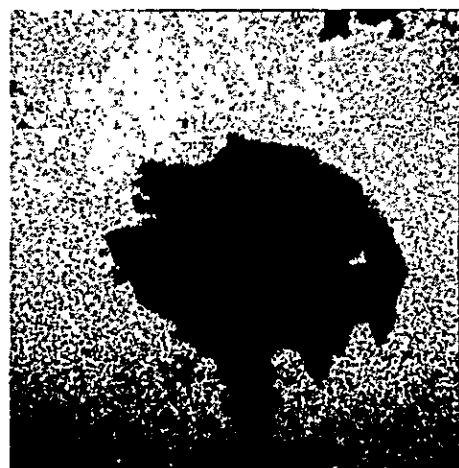
330  $\mu$



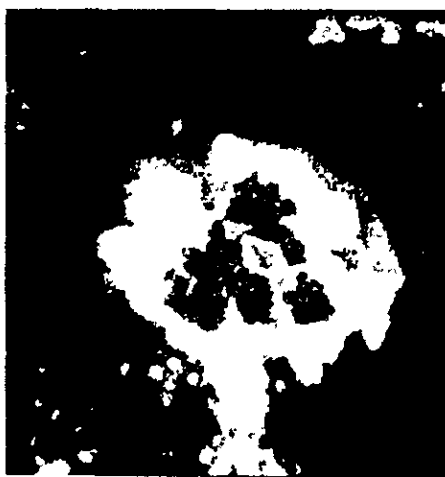
Zn X-ray image



S X-ray image



Ca X-ray image

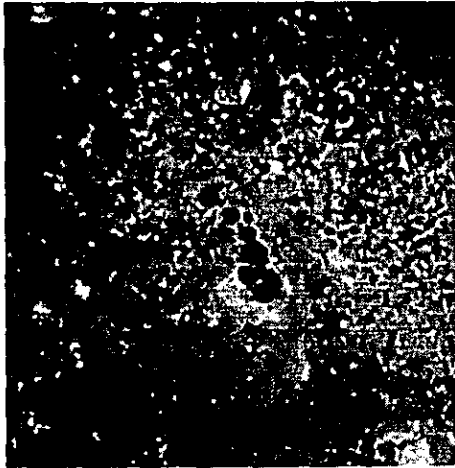


Si X-ray image

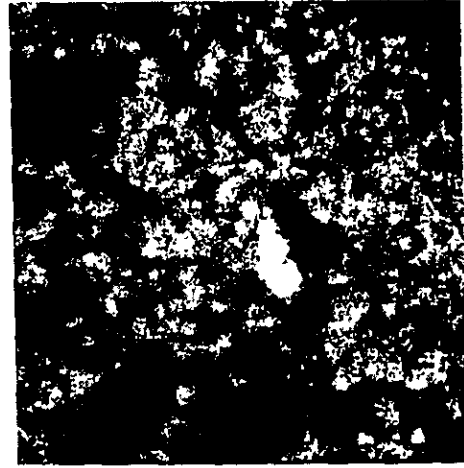
Sample No. P800-②  
Accelerating voltage: 25KV  
Absorbed electron current: 0.2 $\mu$ A  
Magnification: X300



Plate 6.



Absorbed electron image



Fe X-ray image

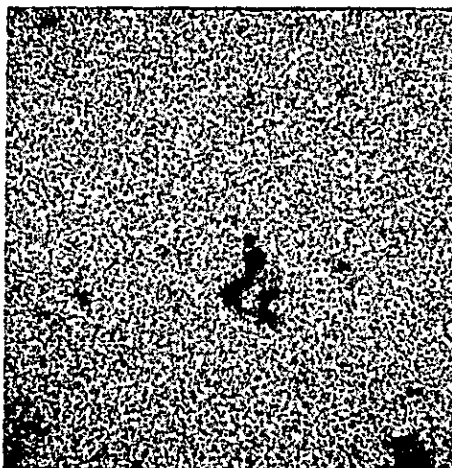
↑  
330 μ  
↓



Zn X-ray image



S X-ray image



Ca X-ray image



Mg X-ray image

Sample No. P754  
Accelerating voltage: 25KV  
Absorbed electron current: 0.2μA  
Magnification: X300

Plate 7.

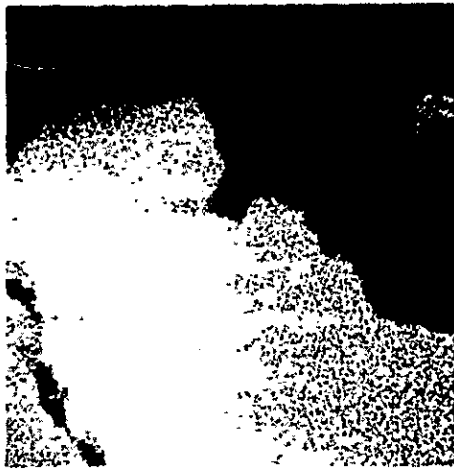


Absorbed electron image



Si X-ray image

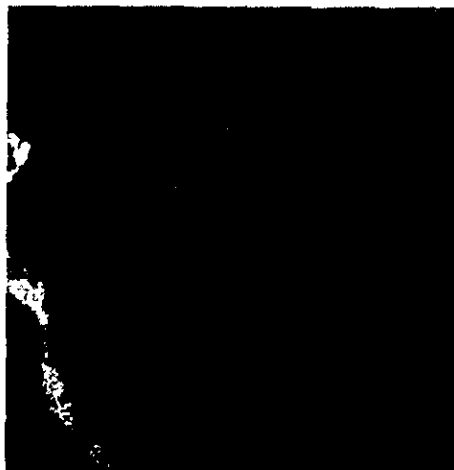
330  $\mu$



Zn X-ray image



S X-ray image



Ca X-ray image



Fe X-ray image

Sample No. S725  
Accelerating voltage: 25KV  
Absorbed electron current: 0.2 $\mu$ A  
Magnification: X300