礦物與材料微分析實驗室
Microanalysis Laboratory for Minerals and Materials

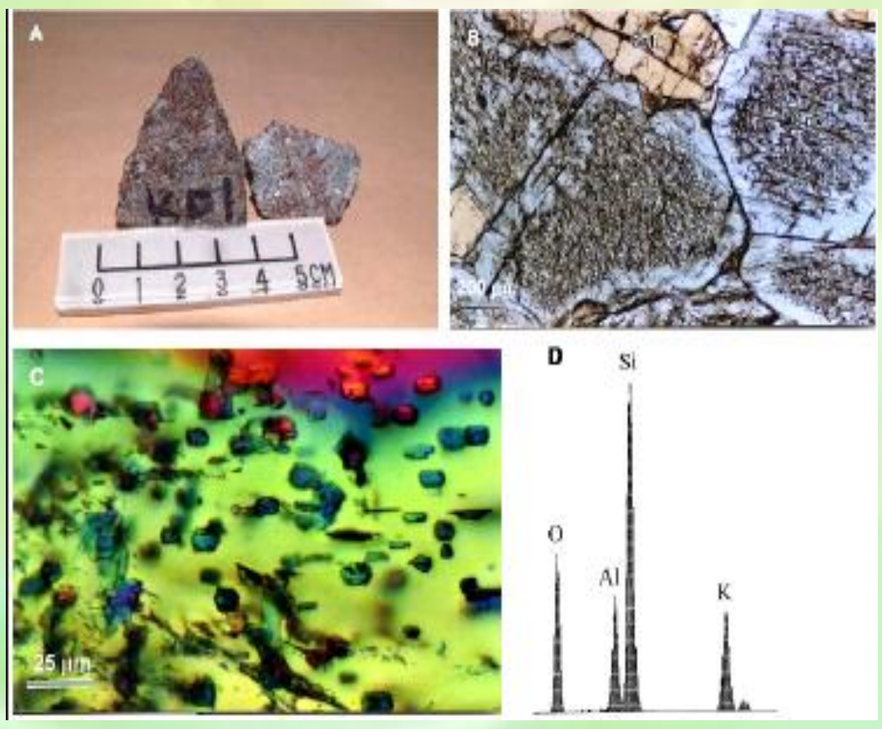
Research

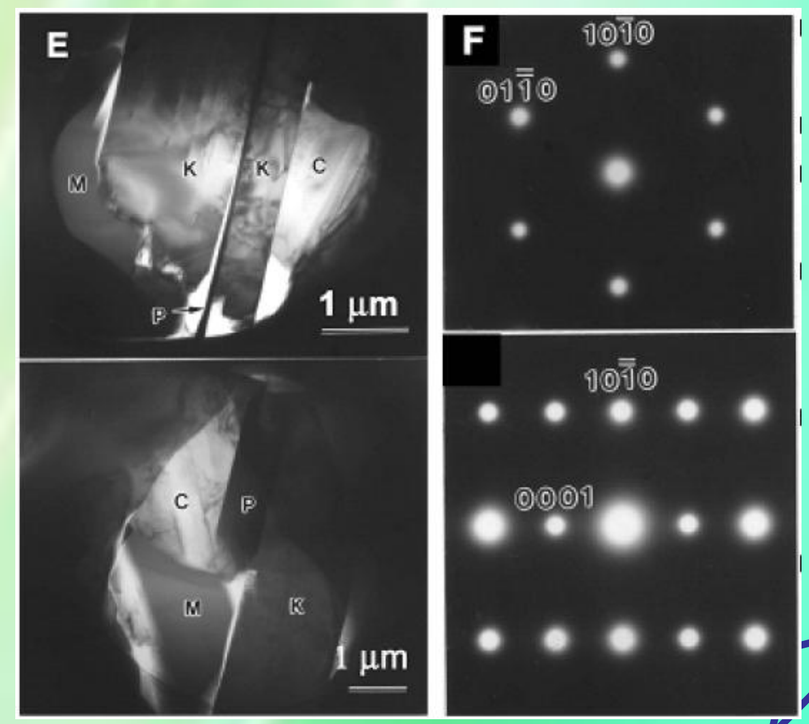
- Crust-derived potassic fluid in metamorphic microdiamond
- New mineral identification
- Submicrometer-size mineral inclusions in metamorphic rock

Research performance

科長石（Kokchetavite）

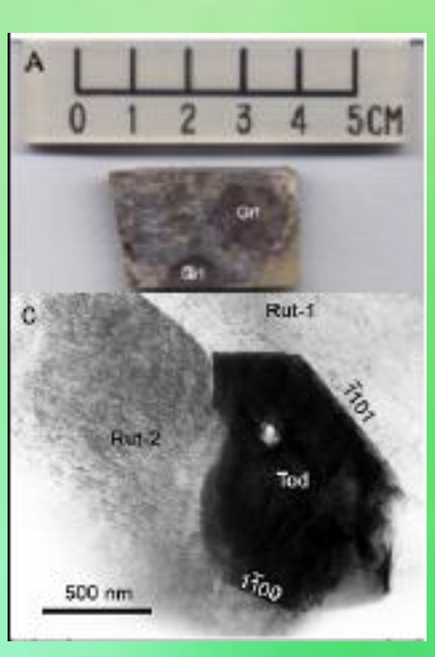
(A) 含**科長石(Kokchetavite)**之石榴子石(Grt)-輝石(Cpx)岩標本KD1。
(B) 標本KD1之低倍率偏光顯微鏡照片。
(C) 標本KD1之高倍率偏光顯微鏡照片，顯示輝石中富含微米級**科長石**。
(D) 能散X-射線成分分析，顯示**科長石**由鉀、鋁、矽、氧組成，其化學成分與尋常之鉀長石相同：$KAlSi_3O_8$。
(E) 穿透式電子顯微鏡照片，顯示**科長石(K)**通常與多矽白雲母(P)、方矽石(C)、與玻璃質相(M)共生。
(F) 穿透式電子顯微鏡電子繞射圖，顯示**科長石**的結晶構造屬於六方晶系，與尋常鉀長石所屬之單斜晶系、三斜晶系不同。

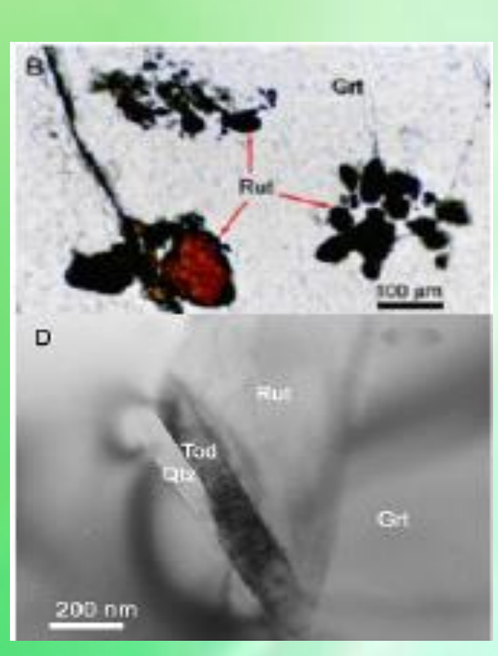


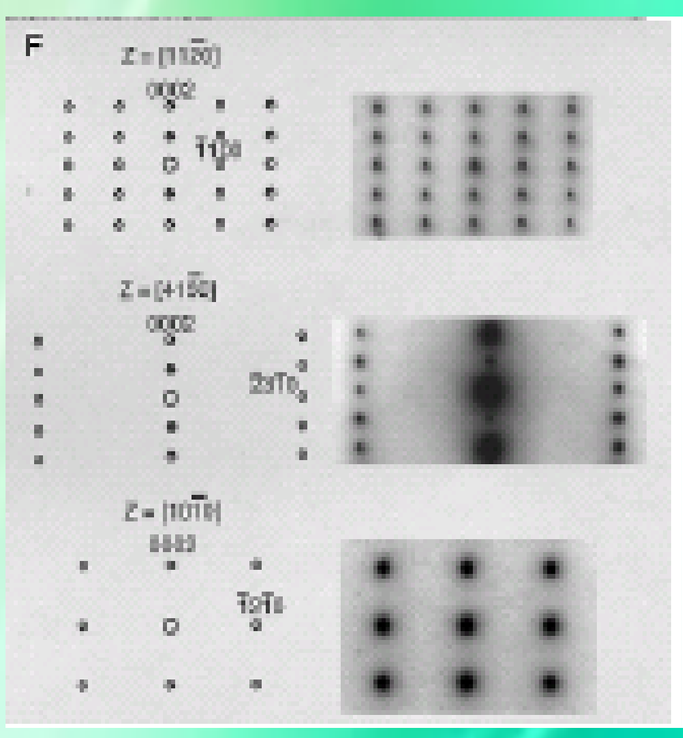


六方水鋁石（Tohdite）

(A) 原倍率照片，顯示白色片岩中含六方水鋁石包裹體之石榴子石斑狀變晶(Grt)。
(B) 偏光顯微鏡照片，顯示石榴子石斑狀變晶(Grt)中富含金紅石(Rut)包裹體。
(C) 穿透式電子顯微鏡照片，顯示石榴子石斑狀變晶中之六方水鋁石(Tod)與金紅石(Rut)等包裹體。
(D) 穿透式電子顯微鏡照片，顯示石榴子石斑狀變晶(Grt)中六方水鋁石(Tod)與金紅石(Rut)、石英(Qtz)共生。
(E) 能散X-射線(EDS)成分分析，顯示六方水鋁石固溶矽、鈦、鉻、鎂、鐵、鋅、鎳等雜質。
(F) 穿透式電子顯微鏡電子繞射圖，顯示六方水鋁石的結晶構造屬於六方晶系。







Crust-derived potassic fluid in metamorphic microdiamond

Figure 1. TEM micrographs showing (A) the general distribution of nano- to submicron-size fluid inclusions, (B) intact and unsealed (arrowed) fluid inclusion pockets bounded by {111} diamond planes, and (C) unsealed inclusion pocket in KD-81. Scale bars: A = 100 nm; B, C = 50 nm.

Figure 2. EDX spectra of (A) intact pocket, (B) unsealed/drained pocket, (C) apatite, (D) sulfate/sulfide and/or chloride. Note that small Cr and Cu peaks in these spectra are artifacts from sample stage.

Figure 3. TEM micrographs showing the evolution of spherical droplets in a large fluid inclusion with irregular boundary: (A) after broad beam observation for ~5-10 minutes, (B) after ~1 – 2 minute's exposure to a focused electron beam, (C) droplets migration due to continuous electron-beam heating. Apatite and Fe-Ti oxide were labeled in (A). Scale bar = 200 nm.

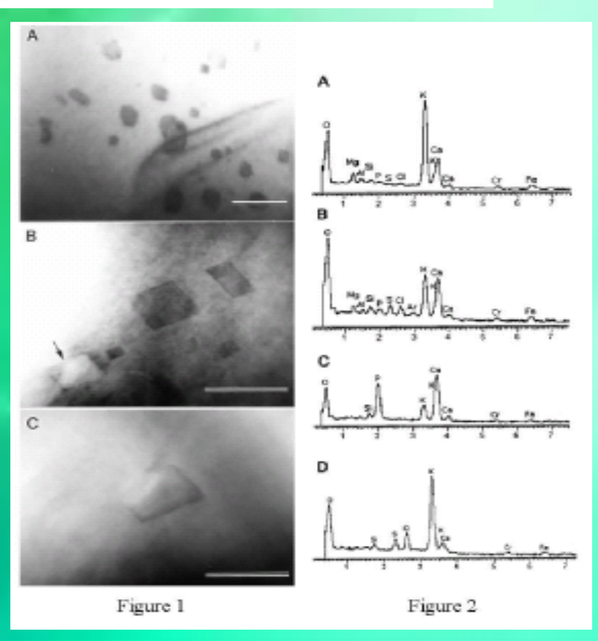


Figure 1 Figure 2

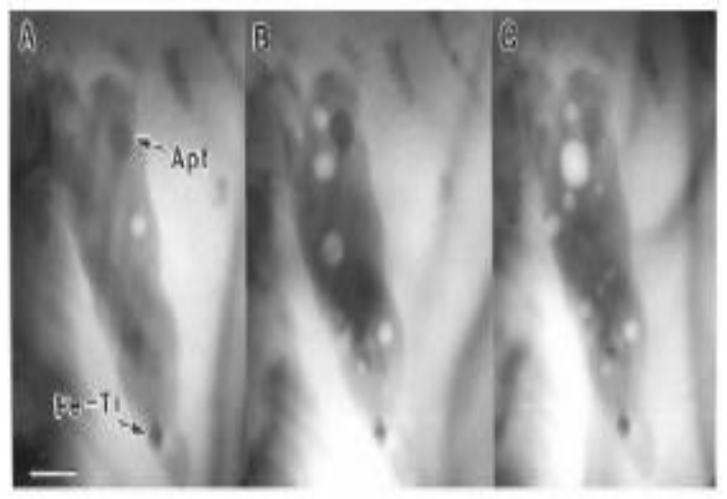


Figure 3

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