

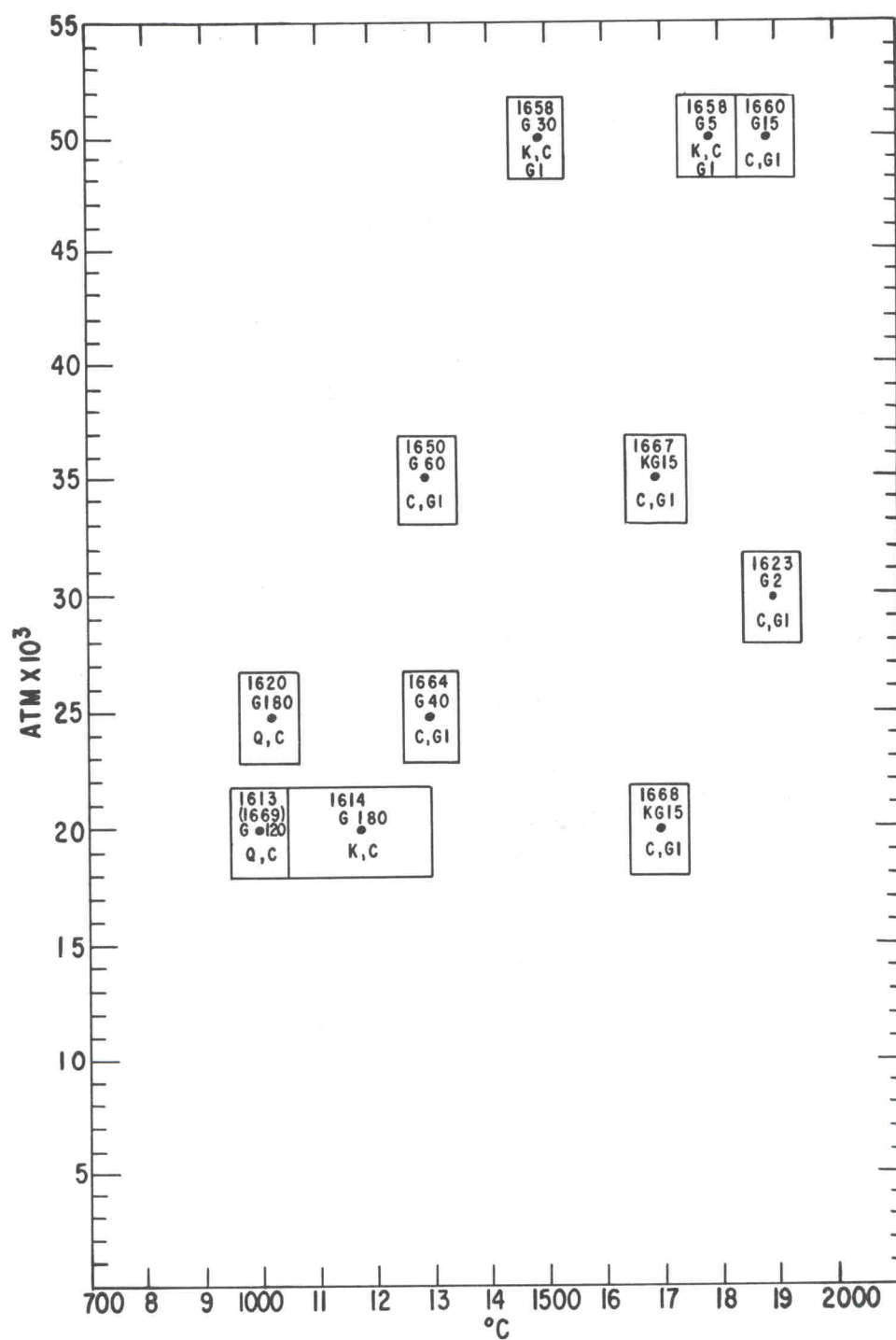


Fig. 4 Plot of runs listed in Table III. Key as in Fig. 1:
G = gel, Q = quartz, KG = kaolinite plus gibbsite.

When kyanite decomposed, the first evidence usually was the formation of glass and small crystals of Al_2O_3 from the fine-grained material at the grain boundaries [Fig. 5(a)]. The larger crystals of kyanite break down to form mullite* and glass [Figs. 5(a), (b)] and then at longer times or at higher temperatures the increased formation of Al_2O_3 is seen [Fig. 5(c)]. Although more data are needed for a firm conclusion, the tentative interpretation is that the final products from the decomposition of kyanite at high temperatures and pressures (above about 20,000 atm) are Al_2O_3 (corundum) and SiO_2 -rich glass, but the reaction path may involve the formation of mullite before the final stage is reached.

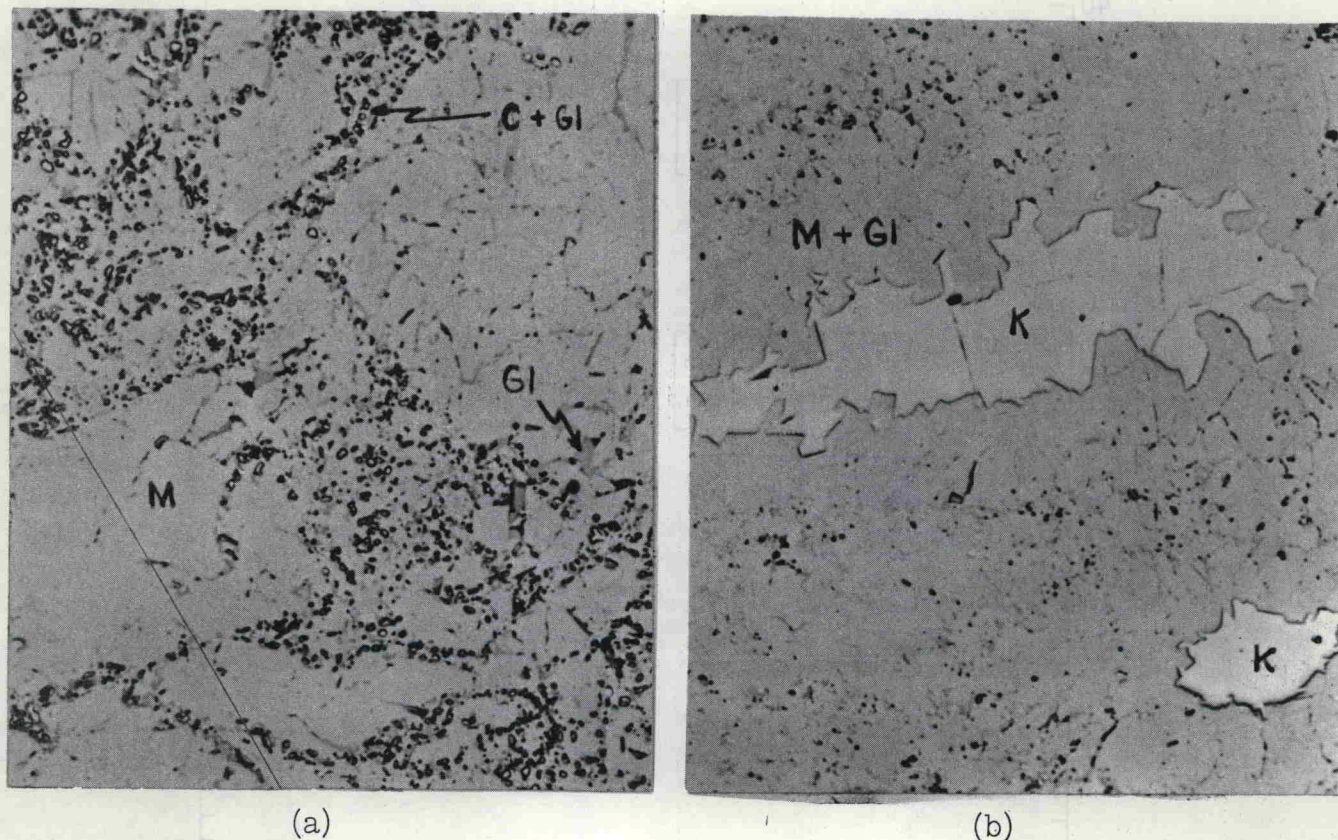


Fig. 5 Polished and etched sections as seen in reflected light, bright field.

HF etchants; C = corundum; Gl = glass; M = mullite; K = kyanite.

500X

(a) Run No. 1648. Corundum and glass at original kyanite grain boundaries; mullite and glass within original kyanite grains.

(b) Run No. 1649. Remnants of kyanite surrounded by mullite plus glass.

(c) Run No. 1624. Large mullite crystals (light grey) in glass (darker grey). Corundum crystals (white) in mullite.

(d) Run No. 1630. Corundum and glass formed from sillimanite.

*Below about 25,000 atm both indices of refraction and the x-ray patterns are consistent with those reported for mullite. There may be some increase in refractive indices at higher pressures.