

Fig. 7. Equilibrium vapour pressure of the reaction: analcime + quartz = albite + water. Curve A is that suggested by synthesis. Curve B is that estimated for the conditions that  $P_{\text{total}} = 3 P_{\text{H}_2\text{O}}$ . The dotted extensions are schematic and illustrate the behaviour expected at low pressures.

Fig. 8. Diagram illustrating the difference in reaction temperatures in areas where  $P_{\text{total}} = P_{\text{H}_2\text{O}}$  and where  $P_{\text{total}} = 3 P_{\text{H}_2\text{O}}$ . X, Y and Z represent the equilibrium vapour pressures for successive dehydration reactions when  $P_{\text{total}} = P_{\text{H}_2\text{O}}$ , and X', Y', and Z' represent vapour pressures for the same reactions when  $P_{\text{total}} = 3 P_{\text{H}_2\text{O}}$ . A gradient of  $30^\circ/\text{km}$  is assumed.

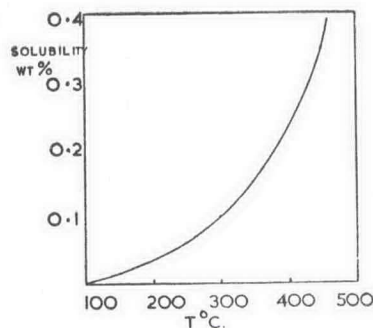
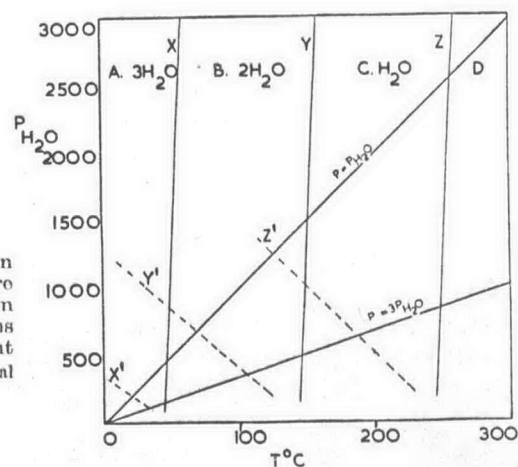


Fig. 9. General form of the 1750 bars solubility curve of quartz in water (after KENNEDY, 1950a).

To regain equilibrium, the temperature must be lowered at constant pressure such that a term  $\Delta T \Delta S$  equals the above  $\Delta P \Delta V$  term. In this region the  $\Delta S$  of the above reaction will be of the order of 5 cal/mole and  $\Delta V_{\text{solids}} = 19 \text{ cm}^3$  so the new equilibrium temperature will be  $150\text{--}200^\circ\text{C}$  below the experimental value. The result is that of curve B (Fig. 7). YODER (1954) has reported failure to produce the expected differential pressure effect with analcime. The subject warrants further investigation (see also HARKER, 1958).