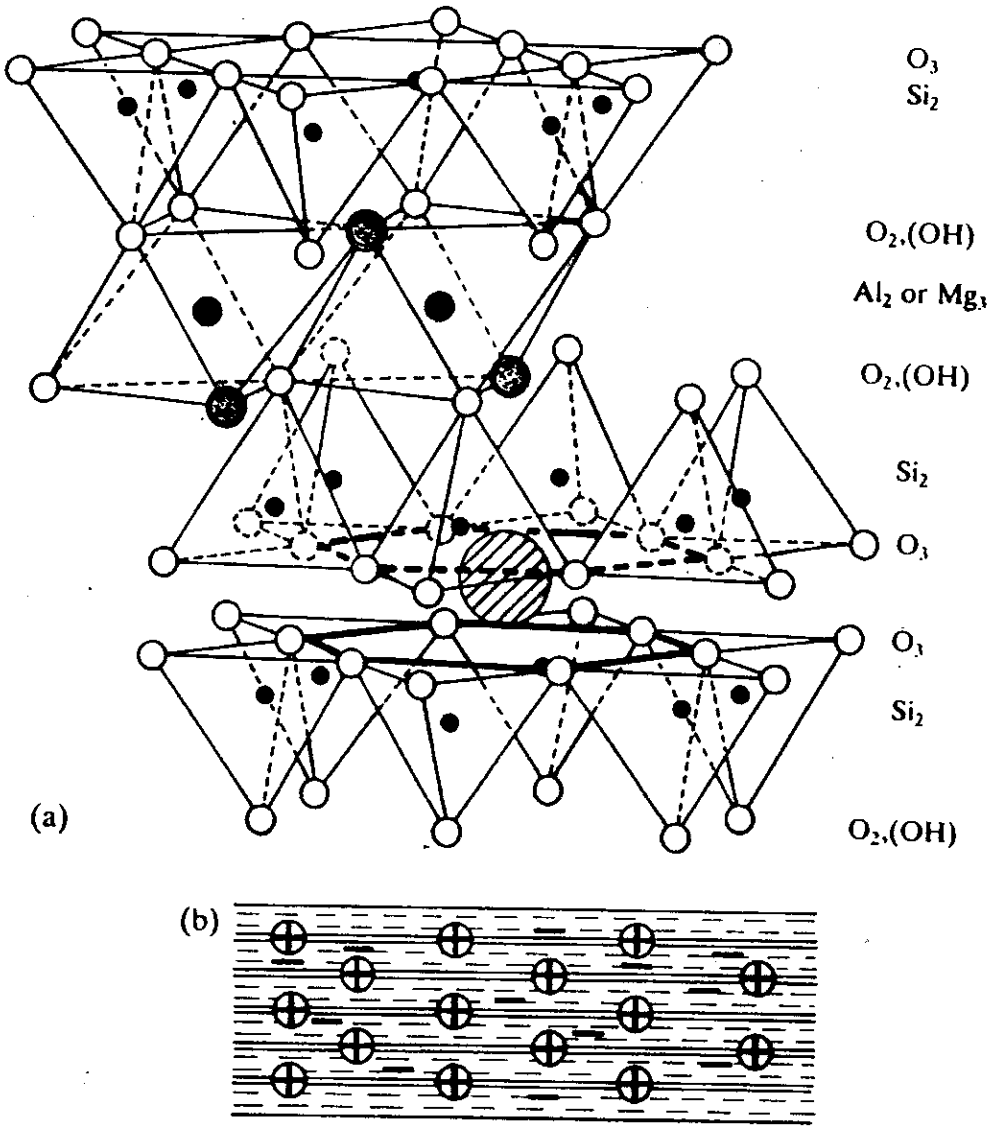

FIG. 1.5.15. (a) A sketch of the ideal 2 : 1 layer silicate. The trioctahedral mineral talc $[(MgO)_2.Mg(OH)_2.(SiO_2)_4]$ has all three octahedral sites occupied by Mg^{2+}. In pyrophyllite $[(AlO(OH))_2(SiO_2)_4]$ only two of the three octahedral sites are occupied by Al^{3+} and as a result the layer is dioctahedral. The large circle shows preferred position of the counterions required to balance the crystal charge after isomorphous replacement. (b) Schematic diagram of the white mica structure. The potassium ions are shown ⊕ and they balance negative charges in the silica layers caused by the substitution of about a quarter of the silicon ions by aluminium. The 'ideal' formula is $K^+[(AlO(OH))_2(AlSi_3O_8)]^-$.