

dispersed in small characteristically lozenge-shaped crystals in many syenites, also in granite, gneiss, and in some volcanic rocks (basalt, trachyte, phonolite).

Zeolites.—Under this name is included a characteristic family of minerals, which have resulted from the alteration, and particularly from the hydration, of other minerals, especially of feldspars. Secondary products, rather than original constituents of rocks, they often occur in cavities both as prominent amygdales and veins, and in minute interstices only perceptible by the microscope. In these minute forms they very commonly present a finely fibrous divergent structure. As already remarked, a relation may often be traced between the containing rock and its inclosed zeolites. Thus among the basalts of the Inner Hebrides, the dirty green decomposed amygdaloidal sheets are the chief repositories of zeolites, while the firm, compact, columnar beds are comparatively free from these alteration products.²⁹ Among the more common zeolites are *Analcime*, *Natrolite*, *Prehnite* and *Stilbite*.

Kaolin (Al_2O_3 38.6–40.7, CaO 0–3.5, K_2O 0–1.9, SiO_2 45.5–46.53, H_2O 9–14.54) results from the alteration of potash- and soda-feldspars exposed to atmospheric influences. Under the microscope the fine white powdery substance is found to include abundant minute six-sided colorless plates and scales which have been formed by recrystallization of the decomposed substance of the feldspar. The purest white kaolin is called *china-clay*, from its extensive use in the manufacture of porcelain. Ordinary clay is impure from admixture of iron, lime, and other ingredients, among which the débris of the undecomposed constituents of the original rock may form a marked proportion.

Talc (MgO 23.19–35.4, FeO 0–4.5, Al_2O_3 0–5.67, SiO_2 56.62–64.53, H_2O 0–6.65) occurs as an essential constituent of talc-schist, and as an alteration product replacing mica, hornblende, augite, olivine, diallage, and other minerals in crystalline rocks.

Chlorite (MgO 24.9–36, FeO 0–5.9, Fe_2O_3 0–11.36, Al_2O_3 10.5–19.9, SiO_2 30–33.5, H_2O 11.5–16), including several varieties or species, occurs in small green hexagonal tables or scaly vermicular or earthy aggregates; is an essential ingredient of chlorite-schist, and occurs abundantly as an alteration product (of hornblende, etc.) in fine filaments, incrustations, and layers in many crystalline rocks. (See

²⁹ See Sullivan in Jukes' "Manual of Geology," p. 85.