

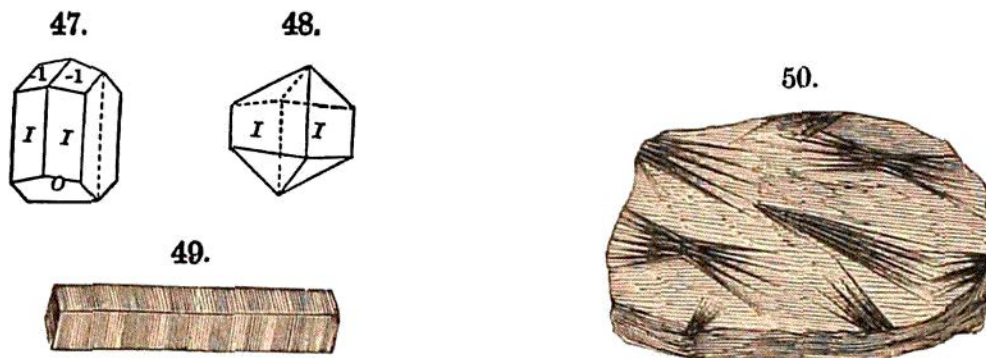
ZIRCON, BERYL, TITANITE (Sphene) are other anhydrous silicates. Zircon is a silicate of zirconia; beryl (aquamarine when pale green and transparent), a silicate of alumina and beryllia; titanite or sphene, a silicate of calcium and titanium.

4. Silicates of Magnesium and Iron or Calcium, with Little or no Alumina and no Water.

CHRYSOLITE. — Occurs in green glassy grains or crystals in basalt and related rocks, and also paler green in rock masses. Also called *olivine*, and in France *peridot*. $H = 6.7$. Infusible. Composition of a common variety: Silica 41.4, magnesia 50.9, iron protoxide 7.7 = 100. A related mineral, *fayalite*, contains iron without magnesium, and is fusible. The crystals often occur changed, partly or wholly, to serpentine.

CHONDRODITE. — A yellow to brown magnesium silicate, containing fluorine, occurring in crystalline limestones. A kind found in ejected masses of limestone at Vesuvius is called *humite*.

HORNBLende (often called amphibole). — Occurs in prisms of $124^{\circ} 30'$ (which is also the cleavage angle). Colors various, from black to green and white. The most common kind in rocks is an iron-bearing variety, in black cleavable grains or in oblong black prisms. Figs. 47, 48, and 49 represent common crystals, and 50 tufts of crystals as they often appear in some rocks. The kind in slender green crystals or fibers is called *actinolite* — a common form of its crystals is shown in Fig. 49; the white (a kind common in crystalline limestones, and containing much lime), *tremolite*. The mineral



is common in fibrous masses; and, when the fibers are as fine as flax, it is called *asbestos*. A common black hornblende consists of silica 48.8, alumina 7.5, magnesia 13.6, lime 10.2, iron protoxide 18.8, manganese protoxide, 1.1 = 100.

PYROXENE (including augite). — Like hornblende in chemical composition and in most of its characters; but the crystals, as in the annexed figures, 51, 52, instead of being prisms of $124^{\circ} 30'$, are prisms of $87^{\circ} 5'$ or nearly (angle *I* on *I*), and are often eight-sided from the truncation of the four edges, as in Fig. 52. Pyroxene and hornblende are hence *paramorphs*, being different in crystallization, but alike in composition. Black and dark green pyroxene in short crystals is called *augite*; it is an iron-bearing kind, and is common in igneous rocks.

ENSTATITE. — Near pyroxene in cleavage angle, but prisms orthorhombic. Infusible or nearly so. It is in part a silicate of magnesium. When a silicate of magnesium and iron, it is often called *bronzite*; and, if containing much iron, *hypersthene*.

5. Silicates of Magnesium, etc., with Water.

TALC. — Very soft, $H = 1$. Crystallizes in flexible folia like mica, but inelastic; also massive-granular (*soapstone* or *steatite*); white and very fine-grained (*French chalk*). Feels very greasy. Consists of silica 62.8, magnesia 33.5, water 3.7 = 100. Infusible.