

SCIENCE DEPARTMENT.

V. COMPOUNDS (*Continued from page 153.*)

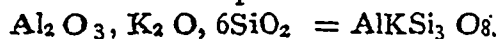
I. OXIDES.

AL.

The only Oxide of Aluminium is Alumina, Al_2O_3 , occurring native in crystals, as Corundum, Ruby, etc. If Aluminium Hydroxide $\text{Al}_2(\text{OH})_6$ be heated, pure Alumina in the form of a white amorphous powder is obtained. Alumina acts as a weak base, acids attacking it with difficulty, forming salts. With strong bases it is electronegative or acts as an acid. Its use in dyeing and calico printing as a mordant depends upon its power of forming insoluble compounds ("lakes,") with vegetable colouring matter, so rendering the colours *fast*.

Clay is not Alumina but an Aluminium Silicate, resulting from the decomposition of felspar by the action of air and water.

The formula of felspar is



The Alkali being soluble in *water* is washed away leaving a mixture of Alumina and Silica behind.

Kaolin or porcelain clay, is the purest form of disintegrated felspar, containing no iron or other impurities.

CR.

Chromium forms a number of compounds with Oxygen:

- (1) Chromus Oxide, CrO .
- (2) Chromic " Cr_2O_3 .
- (3) Chromochromic Oxide, Cr_3O_4 .
- (4) Chromium Trioxide, CrO_3 .

The Monoxide CrO and the Sesquioxide Cr_2O_3 are basic, yielding with acids the corresponding chromous and chromic salts.

Chromochromic Oxide, CrO , Cr_2O_3 , is a neutral body. Chromic trioxide forms a dibasic acid with water, $\text{CrO}_3 + \text{H}_2\text{O} = \text{H}_2\text{CrO}_4$.

(1) Chromus Oxide is so oxidizable that it decomposes water, and is hence only known in the hydrated state $\text{Cr}(\text{OH})_2$.

(2) Chromic Oxide, Cr_2O_3 obtained by igniting the hydroxide, $\text{Cr}_2(\text{OH})_6$, is a dark green, infusible powder, which when strongly heated is nearly insoluble in all acids. It produces the green of the emerald, is also employed as a green colour for painting on porcelain. Chromic Oxide forms greenish black, very hard crystals which are isomorphous with alumina, Al_2O_3 , and Ferric Oxide, Fe_2O_3 .

II. HYDROXIDES.

Ammonia NH_4OH when added to any soluble salt of Aluminium (alum) throws down a white bulky precipitate, *Aluminium* hydroxide, $\text{Al}_2(\text{OH})_6$.

If after the addition of Ammonia in excess, heat is applied, the precipitation is complete.

Same. Chromic hydroxide, $\text{Cr}_2(\text{OH})_6$, is grayish green thrown down out of green solutions, and grayish blue out of violet solutions.

Same.