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When the iodide is in excess reaction (23) is negligible, and hence for every equivalent of arsenic acid formed *r* equivalents of iodine are liberated, or,

$$\frac{h-ic}{x'} (KI \ excess) = r, \tag{25}$$

where h - ic and x' are the amounts of iodide and of arsenious acid oxidized in the same time (both quantities being expressed in *cc* of 0.01 N solution) see page 61.

As shown on page 72, r = 2, and hence the peroxide is As_2O_{g} .

If a primary oxide of chromium be assumed the treatment is similar. Regarding CrO_3 and Cr_2O_3 as the initial and final oxides in the reduction of chromic acid, let the general formula of the peroxide be Cr_2O_{3+3} . Then for the formation of this oxide we have:

$$2CrO_3 + \frac{3-s}{2}As_2O_3 = Cr_2O_{3+s} + \frac{3-s}{2}As_2O_{5}; \qquad (26)$$

for the oxidation of arsenious acid by peroxide,

$$Cr_2O_{3+s} + \frac{s}{2}As_2O_3 = Cr_2O_3 + \frac{s}{2}As_2O_5;$$
 (27)

and for the reaction between peroxide and iodide,

$$Cr_2O_{3+s} + 2sHI = Cr_2O_3 + sI_2.$$
 (28)

When the iodide is in excess, reaction (27) is negligible, hence,

$$\frac{1-ic}{x'} (KI \ excess) = \frac{s}{3-s}.$$
 (29)

As shown on page 72 the value of the ratio (h - ic): x', when the iodide is in excess, is 2, hence s = 2, and the formula of the peroxide is Cr_2O_5 .

(b) From the ratio of the rates of oxidation of the inductor in the absence of the acceptor to that in the presence of excess of the acceptor.

If the peroxide be one of arsenic, As_2O_{b+2n} , we have from equations (23) and (24):

$$\frac{Rac}{Ra,(KI\,excess)} = r + 1, \text{ or, } \frac{Rac - Ra,(KI\,excess)}{Ra,(KI\,excess)} = r. \quad (30)$$

84