

Method for continuous copper pickling using sodium chlorate involves pickling copper with solution based on CuCl_2 , NaClO_3 , and HCl , followed by adjustment of the NaClO_3 and HCl concentrations using pH sensors. In pickling solution, there are narrow concentration ranges for the components, expressed in mol/L: CuCl_2 – 0.75-1.5, HCl – 0.6-0.8, NaClO_3 – 0.05-0.1, which ensure partial self-regeneration of CuCl_2 component; adjustment of solution after pickling begins with the removal of a volume ΔV , with purified water returned to solution being adjusted; ΔV is calculated using an equation based on the concentration of copper ions in initial solution C_0 and spent solution C_2 , and the volume of pickling bath V , namely:

$$\Delta V = \frac{(C_2 - C_0) \cdot V}{C_2},$$

complete oxidation of Cu(I) and the establishment of the optimal concentration range C_{NaClO_3} are achieved by introducing a quantity v_{NaClO_3} into the volume of solution being adjusted, namely

$$v_{\text{NaClO}_3} = C_{\text{NaClO}_3} \cdot V + \frac{C_0 \cdot V(C_2 - C_0 - C_{\text{NaClO}_3})}{3C_2}, \text{ моль}.$$