**Kinetic study of reaction between dolomite ore and trioxonitrate (V) acid (HNO3)**

**Abstract**

The leaching of dolomite (carbonate mineral of calcium and magnesium) in mineral acid such as HNO3 is environmentally friendly with low energy demands, and it has high capacity of processing both in low and high grade ore. The study of the reaction kinetics and mechanism of reaction between dolomite and HNO3 was investigated. The energy-dispersive X-ray spectroscopy (EDS) result showed that Ikpeshi dolomite ore consists of calcium (20.09 %), magnesium (13.93 %) and oxygen (65.99 %). The effect of HNO3 concentration between 0.5 and 2.5 M on the fraction of dolomite was studied, while the reaction temperature was between 30 and 70 °C; the reaction time was 20 to 60 min. The results show the fraction of dolomite that reacted in HNO3 increased as the temperature and concentration increased. Reacted fraction of 0.995 was achieved at 50 min reaction time, acid concentration of 2.5 M, agitation speed of 250 revolution per minutes (rpm) and reaction temperature of 55 °C. The reaction mechanism followed product layer diffusion control of 1+2(1–x) – 3(1–x)2/3 = kt with 0.915 reaction order of hydrogen ion concentration and activation energy of 26.6 KJmol-1.