ABSTRACT

Manganese dioxide nanoparticles were prepared by electrochemical method using potassium permanganate as an electrolyte solution for 3 hours. The voltages and temperatures were the main synthesis parameter used to influence and control the size and structural evolution of MnO₂ nanostructure. Calcination at 400 °C was conducted as the following process to obtain good structures and crystalline phases of MnO₂. The nanoparticles obtained can be α-MnO₂ or Mn₂O₃. In acid solution (pH ~4), the particles produced were α-MnO₂. On the other hand, in basic solution (pH ~9), the particles produced were Mn₂O₃. Both α-MnO₂ and Mn₂O₃ particles are nearly spherical in shape with surface area ranging from 71-157 m²/g and diameter 1579-188 nm. The surface area diameters are influenced by the voltage during electrolysis. The higher the voltage, the larger the diameter particles are.

Keys: MnO₂ nanoparticles, Electrolysis