DESIGN AND FABRICATION OF PRECIPITATION SYSTEM OF CALCIUM CARBONATE (CaCO$_3$) IN WATER USING ELECTRON DISCHARGE AND MAGNETIC FIELD METHODS

Name : Triswantoro Putro  
NRP : 1111 201 710  
Supervisor : Endarko, M. Si., Ph.D

ABSTRACT

Design and fabrication of precipitation system of calcium carbonate (CaCO$_3$) in water using electron discharge and magnetic field methods have been successfully carried out. Magnetic field and electron discharge governed to precipitate calcium carbonate in water. The result showed that the electron discharge can be reduced content of calcium carbonate in the water sample around 17.39% from initial condition of 230 mg/L within 2 hours. Meanwhile for the same long period of treatment around 56.69% from initial condition of 520 mg/L was achieved by three pairs of magnetic field 0.1 T. Furthermore the combination of electron discharge and magnetic field methods can be used to precipitate calcium carbonate in the water sample 300 mg/L around at 76.66% for 2 hours of treatment. The study then investigated the influence of value of magnetic field toward the percentage reduction of calcium carbonate in the water. The study was used two values of magnetic field are 0.05 and 0.1 T for 2 hours of treatment with an initial condition of 230 mg/L of calcium carbonate in the water, result showed that the magnetic field (0.05 T) is resulted in 28.57% less than the magnetic field (0.1T). In addition, the study was investigated the polar position of the magnetic field. Two positions of magnetic field were tested namely the system with alternated polar magnetics and the system without inversion of the polar magnetics. The result showed that the percentage reduction in levels of calcium carbonate with an initial condition of 360 mg/L if the system without inversion of the polar magnetics is generally less than the system with alternated polar magnetics, with reduction level at 30.55% and 57.69%, respectively.

Key words: calcium carbonate (CaCO$_3$), magnetic field, electron discharge