

Research Title Preparation of Water Absorbing Polymer
by Acrylic Acid Polymerization

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Abstract

High water absorbing polymer (HWAP) was prepared by inverse suspension polymerization. The partially neutralized acrylic acid (77.4 mole % neutralized by KOH) was polymerized using potassium persulfate as a free radical initiator and methylenebisacrylamide as a crosslinking agent. The reaction mixture was dispersed into cyclohexane containing surfactants, and carboxymethyl cellulose as a protective colloid and was refluxed to give a gelationeous polymer. After drying the lump polymer was able to absorb about 590 times its own weight of distilled water and 60 times its own weight of 1 % aqueous sodium chloride solution.

HWAP was also prepared by thin layer polymerization. Dropping the reaction mixture onto a hot glass plate over a boiling water bath, the polymer was obtained as small thin films and dried by the heat of polymerization. The ability to absorb distilled water was 150 times its own weight and 30 times for 1 % aqueous sodium chloride solution.

For agricultural use it was found that the roots of a jasmine tree could obtain water from the fully absorbed HWAP mixed in soil though the water in the HWAP was desorbed when it was mixed with soil alone for 2 days. Because of water desorption described, the layering was not successful.

Fully absorbed HWAP when freezed could keep coolness for longer time than ice did. In contrast warmth from hot water could not be kept for as long.

The study for absorbing the water generated from esterification of acetic acid was accomplished but the conclusion could not yet be obtained.