



INTISARI

Hydrolyzed Partially Polyacrylamide (HPAM) mempunyai berat molekul yang tinggi dan larut dalam air, sehingga polimer ini digunakan pada proses *Enhanced Oil Recovery*. Polimer ini dapat menaikkan viskositas air. Penelitian ini bertujuan memperoleh parameter yang mempengaruhi kecepatan reaksi dan memperoleh persamaan kecepatan reaksi hidrolisis poliakrilamid dalam suasana basa.

Poliakrilamid diperoleh dari polimerisasi akrilamid dengan menggunakan metode *mixed solvent precipitation*. Hidrolisis poliakrilamid dilakukan didalam reaktor batch yang dilengkapi dengan pengaduk, termometer, pendingin tegak dan pemanas. Larutan NaOH dimasukkan ke dalam reaktor dan dipanaskan sampai mencapai suhu tertentu, kemudian ditambahkan poliakrilamid. Suhu dan kecepatan pengadukan selama proses dijaga tetap. Cuplikan diambil pada selang waktu 15 menit untuk dianalisa dengan titrasi asam-basa. Peubah yang dipelajari meliputi suhu, konsentrasi katalisator dan konsentrasi amida.

Berdasarkan hasil penelitian, dapat disimpulkan bahwa reaksi hidrolisis poliakrilamid dalam suasana basa merupakan reaksi orde 1,4 semu terhadap amida. Konstanta kecepatan reaksi dipengaruhi oleh suhu dan konsentrasi katalisator. Pada kisaran peubah yang dipelajari, diperoleh persamaan hubungan k' sebagai berikut :

- Variasi suhu antara 40°C (313 K) sampai 90°C (363 K),
 $k' = 0,93118745 e^{-2766,91/T}$, ml^{0,4} mgek^{-0,4} mnt⁻¹, ralat rerata 3,72 %.
- Variasi konsentrasi katalisator antara 0,3 sampai 0,8 N,
 $k' = 2,627728 \cdot 10^{-3} e^{(3,567011 C_{kat} - 1365,24/T)}$, ml^{0,4} mgek^{-0,4} mnt⁻¹, ralat rerata 16,53 %
- Dengan persamaan gabungan variasi,
 $k' = 0,118777 e^{(3,71425 \cdot C_{kat} - 2680,933/T)}$, ml^{0,4} mgek^{-0,4} mnt⁻¹, ralat rerata 10,88 %.

Kata kunci : Poliakrilamid, HPAM, EOR, hidrolisis, kecepatan reaksi, konversi



ABSTRACT

Because of the high molecular weight the water soluble polymers used in this Enhanced Oil Recovery (EOR) technique, only a small of polymer will bring about a substantial increase in water viscosity. Hydrolysis of polyacrylamide under basic conditions was studied with emphasizing on the kinetic aspect.

Polyacrylamide derived from polymerization of acrylamide using mixed solvent precipitation method. Hydrolysis of polyacrylamide was carried out in batch reactor equipped with a stirrer, thermometer, condensor and heater. A solution of sodium hydroxide was put in to reactor and heated to the desired temperature. When the desired temperature was reached, polyacrylamide was introduced quickly in the reaction medium. During the process, the temperature was kept constant. Samples were taken from the reaction medium at a regular time then analyzed by acid-alkalimetri method. The affect of temperature, concentration of sodium hydroxide and concentration of amide in water to k' , were studied in this investigation.

It could be concluded that the reaction was found to be pseudo 1.4 order with respect to the amide. Temperature and catalyts concentration affected to the reaction rate constant. The correlation developed by operation condition for the reaction rate constant were :

- Temperature in range of 40°C (313 K) to 90°C (363 K),
 $k' = 0.93118745 e^{-2766.91/T}$, ml^{0,4} mgek^{-0,4} mnt⁻¹ ,average error 3.72 %.
- Catalyts concentration in range of 0.3 to 0.8 N,
 $k' = 2.627728.10^{-3} e^{(3.567011 C_{kat} - 1365.24/T)}$,ml^{0,4} mgek^{-0,4} mnt⁻¹ ,
average error 16.53 %.
- The generalized correlation :
 $k' = 0.118777 e^{(3.71425. C_{kat} - 2680.933/T)}$,ml^{0,4} mgek^{-0,4} mnt⁻¹ ,average error 10.88 %.

Key Words : polyacrylamide, HPAM, EOR, hydrolysis, reaction rate, conversion