

Sodium Polyacrylate as a Super Absorbent

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Abstract: *This work is devoted to the study of the synthesis, properties and practical applications of the class of superabsorbent polymers based on the acrylate Polyacrylamide (PAA). Solution, emulsion/gel polymerization techniques were used for the synthesis. Each absorbent was characterized primarily by its equilibrium water absorption capacity and absorption rate. The swelling characteristics of the polymers were evaluated in terms of changes in polymerization variables, which include the type and amount of crosslinker, monomer composition and polymerization process, temperature, initiator concentration, monomer concentration, mixing speed, and product particle size. The rapidly growing nanotechnology has led to further exploration of SAP and SAPC for biomedical, biotechnology, and advanced technology applications. Examples of SAP and SAPC research work published in peer-reviewed, peer-reviewed articles are listed..*

Keywords: PAA superabsorbent polymers; swelling properties of SAP. Superabsorbent polycomposites; Water absorption capacity; cross-linking reaction;

BIBLIOGRAPHY

- [1]. Gill, R.I.S. (1985). Flocculation of kaolinite suspensions using cationic polyacrylamide. Ph.D thesis, The University of Reading, Reading, Berkshire. England.
- [2]. Culp, R.L. (1977). Direct filtration. J. Amer. Water Works Assoc., 69 (7), 378.
- [3]. Gill, R.I.S. and Herrington, T.M. (1988). Flake size studies on kaolin suspensions flocculated with cationic polyacrylamides, Colloid and Surfaces, 32, 331-344.
- [4]. Molyneux, P. (1982). Water-soluble synthetic polymers: properties and behavior. Volume I. Florida: CRC Press.
- [5]. Ives, K.J. (1978). The Scientific Basis of Flocculation, NATO ASI Series, Sijthoff and Noordhoff, Alphen aan den Rijn, (Ed.).
- [6]. Thompson, H.W. and Torkington, P. (1945). Trance. Farad. Soc., 41, 246.
- [7]. Öz, N and Akar, A. (2000). Low molecular weight polyacrylic acid with attached aminomethylenephosphonic acid groups. J.App. Poly. Sci., 78, 870-874.
- [8]. Nayak, B.R. and Singh, R.P. (2001). Synthesis and characterization of grafted hydroxypropyl guar gum by cerium ion-induced initiation. Eur. Poly. J., 37(8), 1655-1666
- [9]. Ghosh, P. Chakrabarti, A. and Siddhanta S. K. (1999). A study of stable aqueous polyaniline prepared using polyacrylamide as a water-soluble carrier polymer. Euro. Poly. J., 35(5), 803-813.
- [10]. Louie, J. and Hartwig, J.F. (1997). Discrete high molecular weight triarylaminedendrimers prepared by palladium-catalyzedamination. J. Am. Chem. Soc., 119, 11659-11696.
- [11]. Stevens, M.P. (1990). Polymer Chemistry an Introduction (2nd ed.) 171-172.
- [12]. Ismail, M. Vangani, V. Rakshit, A. K. (1997). Terpolymerization of acrylamide, acrylic acid and acrylonitrile: synthesis and properties. J.App. Poly. Sci., 69, 217-228.
- [13]. Herth G, Schornick G, Buchholz F (2015). "Polyacrylamides and poly(acrylic acids)". Ullmann Encyclopedia of Industrial Chemistry. Weinheim: Wiley-VCH. pp. 1-16. doi:10.1002/14356007.a21_143.pub2.

- [14]. "Polyacrylamide". Database of dangerous substances. United States National Library of Medicine. 14 Feb 2003. Consumption Patterns. CASRN: 9003-05-8. Archived from the original on 30 December 2018. Retrieved 30 November 2013.
- [15]. BoyaXiong, Rebeca Dettam Loss, Derrick Shields, Taylor Pawlik, Richard Hochreiter, Andrew L Zydney & Manish Kumar (2018). "Polyacrylamide degradation and its implications in environmental systems". Clean water. 1. doi:10.1038/s41545-018-0016-8.