

Article

Adsorptive Removal of Methylene Blue from Aquatic Environments Using Thiourea-Modified Poly(Acrylonitrile-co-Acrylic Acid)

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Supplementary Data

Calculation of Actual Copolymer Composition

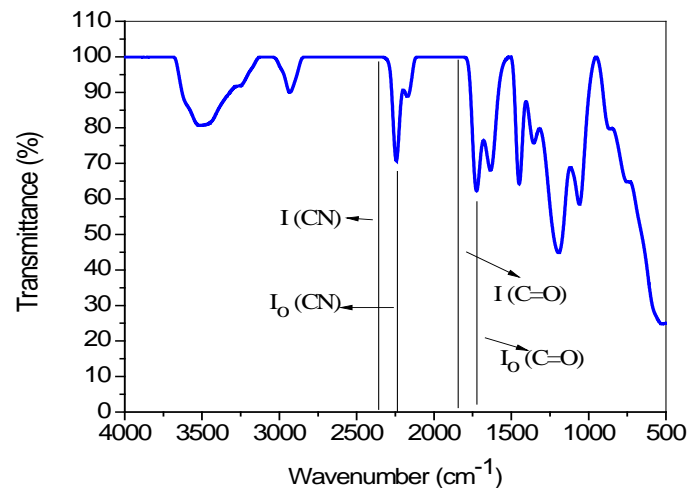


Figure S1. IR spectra of a 97:3 poly(AN-co-AA) for ODR value.

The actual composition of poly(AN-co-AA) copolymer was calculated using optical density ratio (ODR) value to reduce the error of physical variations [1]. The ODR equation is written as

$$ODR = \frac{(Absorbance\ ratio)_{w(C=O)}}{(Absorbance\ ratio)_{w(C=N)}} = \frac{\log(I_o/I)_{w(C=O)}}{\log(I_o/I)_{w(C=N)}} \quad (S1)$$

Where I and I_0 are the intensities of the transmitted and incident radiations, respectively. These are obtained from the infrared (IR) spectrum as shown in Figure S1.

$$ODR = \frac{\log(I_o/I)_{w(C=O)}}{\log(I_o/I)_{w(C=N)}} = \frac{\log(62.24/99.94)_{w(C=O)}}{\log(71.19/99.88)_{w(C=N)}} = 1.399$$

Then, the ODR value was used to substitute the “ y ” in Equation (S2) [2]

$$x = 16.3y - 8.5y^2 + 2.24y^3 - 1.78 \quad (S2)$$

$$x = 10.52 \text{ \% of AA}$$

Thus, the actual composition of AN:AA feed of 97:3 poly(AN-co-AA) was 89.48:10.52

Reference

1. Akbari, S.; Kish, M.H.; Entezami, A.A. Copolymer of acrylonitrile/acrylic acid film dendrigrated with citric acid: Host/guest properties of dendrigrated/dye complexes in relation to acrylic acid content. *Iran. Polym. J. (English Ed.)* **2011**, *20*, 539–549.
2. Moghadam, S.S.; Bahrami, S.H. Copolymerization of Acrylonitrile-acrylic Acid in DMF-water Mixture. *Iran. Polym. J.* **2005**, *14*, 1032–1041.