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SENSING OF ENVIRONMENTAL POLLUTANT BY CONDUCTIVE COMPOSITE FROM PREPARED FROM HYPERBRANCHED POLYMER-GRAFTED CARBON BLACK AND CRYSTALLINE POLYMER

Y. Taniguchi[1], J. Chen[1], M. Ogawa[1], K. Yokoyama[1], H. Shimizu[1], Y. Maekawa[2], M. Yoshida[2], N. Tsubokawa[1]

[1]Department of Material Science and Technology, Faculty of Engineering, Niigata University, 8050, Ikarashi Ninocho, Niigata 950-2181, Japan

[2]Takasaki Radiation Chemistry Research Establishment, Japan Atomic Energy, Research Institute, 1233 Watanuki-machi, Takasaki, Gunma 370-1292, Japan

The hyperbranched (HB) polymer-grafted (PG) carbon blacks (CB) have the possibility of utilizing as a support of catalyst and enzyme, and a curing agent of epoxy resin, because they have much terminal amino or hydroxyl groups. The postgrafting of crystalline polymer onto HB PG CB and the sensing of environmental pollutant by the conductive composite prepared from the polymer-postgrafted CB was discussed. The grafting of poly(amidoamide) onto CB surface was achieved by repeating either Michael addition of methyl acrylate to amino group on the surface or the amidation of the resulting terminal methyl ester group with ethylene diamine. HB polyester onto CB surface was grafted by stepwise growth of 2,2-*bis*(hydroxymethyl)propionic acid (*bis*-MPA) from surface carboxyl and hydroxyl groups on CB as a core in the presence of *p*-toluenesulfonic acid (*p*-TSA). The one-pot grafting of HB polyester onto CB as core was also achieved by the polycondensation of *bis*-MPA in the presence of *p*-TSA. Postgrafting of crystalline polymer onto HB polymer-grafted CB was achieved by the reaction of terminal amino or hydroxyl groups of grafted chain with COCl-terminated crystalline polymer. The electric resistance of the composite prepared from crystalline polymer-postgrafted CB was found to increase drastically in hexane, containing environmental pollutant, such as chloroform and trichloroethane, and returned immediately to the initial resistance when it was transferred into pure hexane. Based on the above results, it is concluded that the composite can be used as a novel sensor for environmental pollutant in solution.

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