

# PRE-IRRADIATION INDUCED PRAPARATION OF AMINE-TYPE ADSORBENTS WITH EMULSION GRAFT POLYMERIZATION OF GLYCIDYL METHACRYLATE ON PE NON-WOVEN FABRIC

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A mild pre-irradiation method was used to graft glycidyl methacrylate (GMA) onto polyethylene (PE) non-woven fabric. The polymer was irradiated by electron beam at a voltage of 1.8 MeV and a current of 2 mA in air atmosphere at room temperature. The degree of grafting ( $D_g$ ) was determined as a function of reaction time, irradiation dose, monomer concentration and temperature. After 30 kGy irradiation, with 5% GMA, the surfactant Tw-20 of 0.5% at 55 °C for 15 min, the trunk polymer was made grafted at a  $D_g$  of 150%. Selected PE-g-PGMA of different  $D_g$ s was modified with such compounds as ethylenediamine (EDA), diethylenetriamine (DETA), triethylenetetramine (TETA) and tetraethylenepentamine (TEPA). The obtained amine-type adsorbents were prepared specialty for the further removal of copper and uranium from solution. It was shown that at least 90% 1 ppm copper and 60% uranium with the initial concentration from 3 to 1000 ppb can be removed from water.

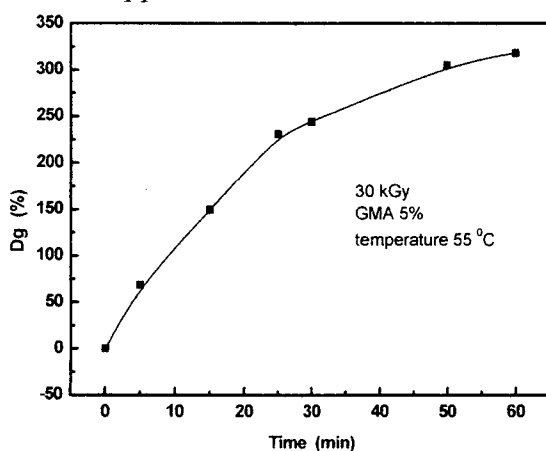


Fig. Time course of GMA grafting on PE non-woven fabrics.

Dose: 30 kGy, GMA concentration: 5%,  
Temperature: 55°C.

U / ppb	Removal Rate / %			
	Solution	pure uranyl nitrate solution		uranyl nitrate solution with NaHCO <sub>3</sub>
Adsorbents-type	EDA	TETA	EDA	TETA
3	91.5	87.6	42.9	48.7
10	96.4	96.1	74.0	69.3
100	90.5	89.2	65.2	61.1
1000	77.5	71.9	64.2	60.1

Table. Removal Rate of U ions in two solutions with two adsorbents.

## Reference

- [1] N. Seko, N. Thi Yen Ninh, M. Tamada, *Rad. Phys. Chem.* **79**, 22 (2010)

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