

JOTCSA, volume 2, issue 2, 2015



TURKISH CHEMICAL SOCIETY

Journal of the Turkish Chemical Society, Section A: Chemistry
Owned by the Turkish Chemical Society
Correspondence e-mail: jotcsa@turchemsoc.org
Founded in February, 2014

ADSORPTION BEHAVIOUR OF HAZARDOUS ORGANIC SOLUTIONS ONTO NEW POLYMERIC SORBENT

YENİ BİR POLİMER ÜZERİNDE TEHLİKELİ ORGANİK ÇÖZELTİLERİN ADSORPSİYON DAVRANIŞI

Gizem AKDUT¹ , Fatih BİLDİK² , Filiz ŞENKAL² and Tuba ŞİŞMANOĞLU¹

¹Department of Chemistry , Engineering Faculty, Istanbul University, Avcılar – İstanbul,
Turkey

²Department of Chemistry , Faculty of Science and Letters, Istanbul Technical University, ,
Maslak, İstanbul, Turkey

*Corresponding author. tusase3@gmail.com (T.Şişmanoğlu)

ABSTRACT

The fate of herbicides in soil, and surface and groundwaters is determined by several factors including retention, transformation, and transport processes. Environmental pollutants removed from waters of these chemicals is important for all biologic life.

In this study, adsorption of textile dyestuffs or adsorption of pesticides such as bisphenol A, 4-amino nitrophenol, phenoxyacetic acid were examined on PVBCIm. This polymer was obtained by modifying polyvinyl benzyl chloride (PVBC) resin with imidazole. This method, has been extended to chloro methyl group to prepare poly (N-vinyl imidazole) (PVIIm) graft chains on crosslinked polyvinyl benzyl chloride (PVBC) polymer.

In the aqueous solution the adsorption of organic waste was determined by UV-vis spectrophotometer. For different concentrations of hazardous organic wastes in aqueous solution, Freundlich, Langmuir, and BET isotherms were applied at 25°C.

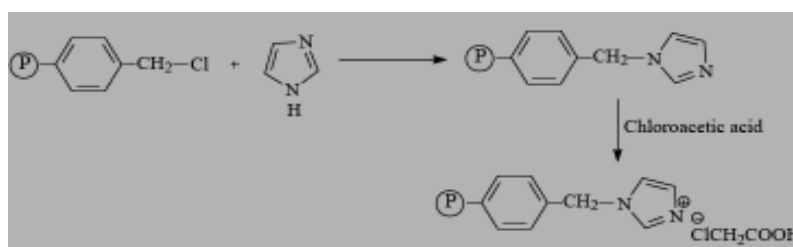


Figure 1: Synthesis of PVBCIm resin.

Keywords

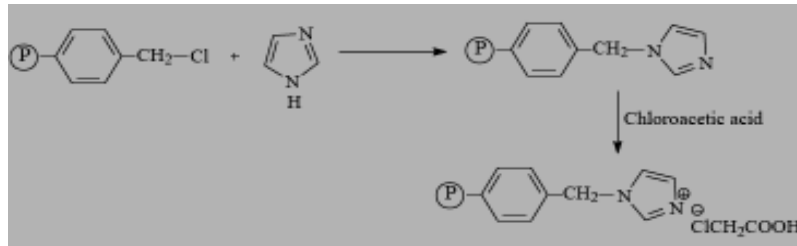
Adsorption, pesticide, isotherm, polymer, resin, dyestuffs.

ÖZET

Herbisidlerin toprakta, yüzey ve yeraltı sularındaki akıbeti, tutulma, dönüşüm ve ulaşım süreçleri dahil olmak üzere çeşitli faktörler tarafından belirlenir. Çevresel kirleticiler olan bu kimyasalların sulardan uzaklaştırılması tüm biyolojik hayat için çok önemlidir.

Bu çalışmada, tekstil boyarmaddeleri ya da bisfenol A, 4-amino nitro fenol , fenoksi asetik asit gibi pestisidlerin adsorpsiyonu PVBCIm üzerinde incelendi. Bu polimer polivinil benzil klorür reçinesinin imidazol ile geliştirilmesiyle elde edildi. Bu metot, klorometil gruplarına çapraz bağlı poli vinil benzil klorür (PVBC) polimeri üzerine poli (N-vinil imidazol) (PVI) aşılantı polimer zincirleri hazırlamak için uyarlanmıştır.

Sulu çözültideki organik atık adsorpsiyonu UV-vis spektrofotometresi ile belirlendi. Tehlikeli organik atıkların sulu çözültülerinin farklı konsantrasyonları için, Freundlich, Langmuir ve BET izotermleri 25 °C de uygulandı.



Şekil 1: PVBCIm reçinesinin sentezi.

Anahtar Kelimeler

Adsorpsiyon, pestisid, izoterm, polimer, reçine, boyarmadde

Kaynaklar / References

- [1] Caren Weinhouse, Olivia S. Anderson, Ingrid L. Bergin, David J. Vandenberg, Joseph P. Gyekis, Marc A. Dingman, Jingyun Yang, and Dana C. Dolinoy, Dose-Dependent Incidence of Hepatic Tumors in Adult Mice following Perinatal Exposure to Bisphenol A, <http://dx.doi.org/10.1289/ehp.1307449>
- [2] NEPC 1999, 'Schedule B (7a), Guideline on health-based investigation levels', National Environment Protection (Assessment of Site Contamination) Measure, National Environment Protection Council.
- [3] Dursun Saraydin and Erdener Karadag, Removal of Phenoxyacetic Acid Based Herbicides by Crosslinked Poly(N-vinyl pyrrolidone) Iranian Polymer Journal 10(2) 105-110 (1996)