

Activated Carbon Post Treatment - Influence on Phenolic Compounds Removal

I. Cansado^a, P. Mourão^b, A. Falcão^c, M. Ribeiro Carrott^d and P. Carrott^e

Centro de Química de Évora, Departamento de Química da ECT, Universidade de Évora, Rua Romão Ramalho n.º59, 7000-671 Évora - Portugal

^a ippc@uevora.pt

During the last decade an increasing interest has been expressed in using biomass and industrial wastes as adsorbents for environmental control. In this field, the preparation of activated carbons (AC) from waste PET and cork as precursors is of actual interest. In other respects, the preparation of AC modified by increasing its basic character gave rise to our group studies aiming at the development of competitive adsorbents with applications in different fields. ACs presenting a basic character show a higher adsorption capacity for phenolic compounds from liquid media [1]. Therefore, AC were produced by activation with KOH from waste cork or from recycled PET and later modified in a 1 mol/dm³ NaOH solution, at high temperature. The samples obtained from cork and PET were designated by Cork-KOH/NaOH and PET-KOH/NaOH. All AC were characterised by N₂ adsorption at 77 K in order to obtain their textural properties.

Concerning the post treatment with NaOH, with PET-KOH/NaOH, a pore volume reduction was noticed. In contrast, with Cork-KOH/NaOH a significant increase in the pore volume was obvious. In fig.1, we present the *p*-nitrophenol removal with untreated and modified AC. The results obtained are very promising, and particularly, with Cork-KOH/NaOH, the *p*-nitrophenol adsorption capacity increased, revealing the influence of the textural and chemical character in this process.

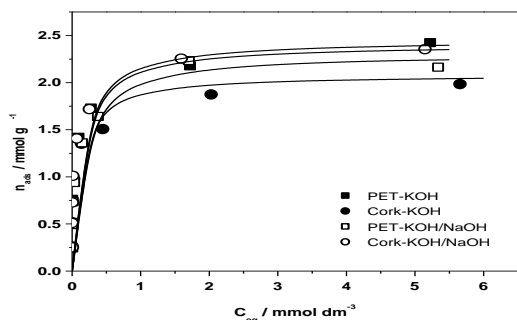


Fig.1- *p*-nitrophenol removal using the initial AC, and after submitting to a basic treatment with NaOH.

Acknowledgements: This work was supported by the Fundação para a Ciência e a Tecnologia (Plurianual Finance Project Centro de Química de Évora (619)). The authors are also grateful to Selenis (Portugal) for the provision of the granulated recycled PET.

References

- [1] G.G. Stavropoulos, P. Samaras and G.P. Sakellariopoulos, Journal of Hazardous Materials, 151 (2008) 414.