Preparation and modification of activated carbon fibres by microwave heating

J.M. Valente Nabais a,*, P.J.M. Carrott a, M.M.L. Ribeiro Carrott a, J.A. Menendez b

a Centro de Quimica de Évora & Departamento de Quimica, Rua Romão Ramalho, No. 59, Évora 7000, Portugal
b Instituto Nacional del Carbón, CSIC, Apartado 73, Oviedo 33080, Spain

Received 10 July 2003; accepted 28 December 2003
Available online 7 February 2004

Abstract
Thermal treatment of activated carbon fibres (ACF) has been carried out using a microwave device, instead of a conventional furnace. The results show that microwave treatment affects the porosity of the ACFs, causing a reduction in micropore volume and micropore size. More importantly, the results also show that microwave treatment is a very effective method for modifying the surface chemistry of the ACFs with the production of pyrone groups, detected by FTIR. As a result very basic carbons, with points of zero charge approximately equal to 11, are readily obtained.

© 2004 Elsevier Ltd. All rights reserved.

Keywords: A. Activated carbon, Carbon fibres; B. Heat treatment; C. Infrared spectroscopy; D. Chemical structure