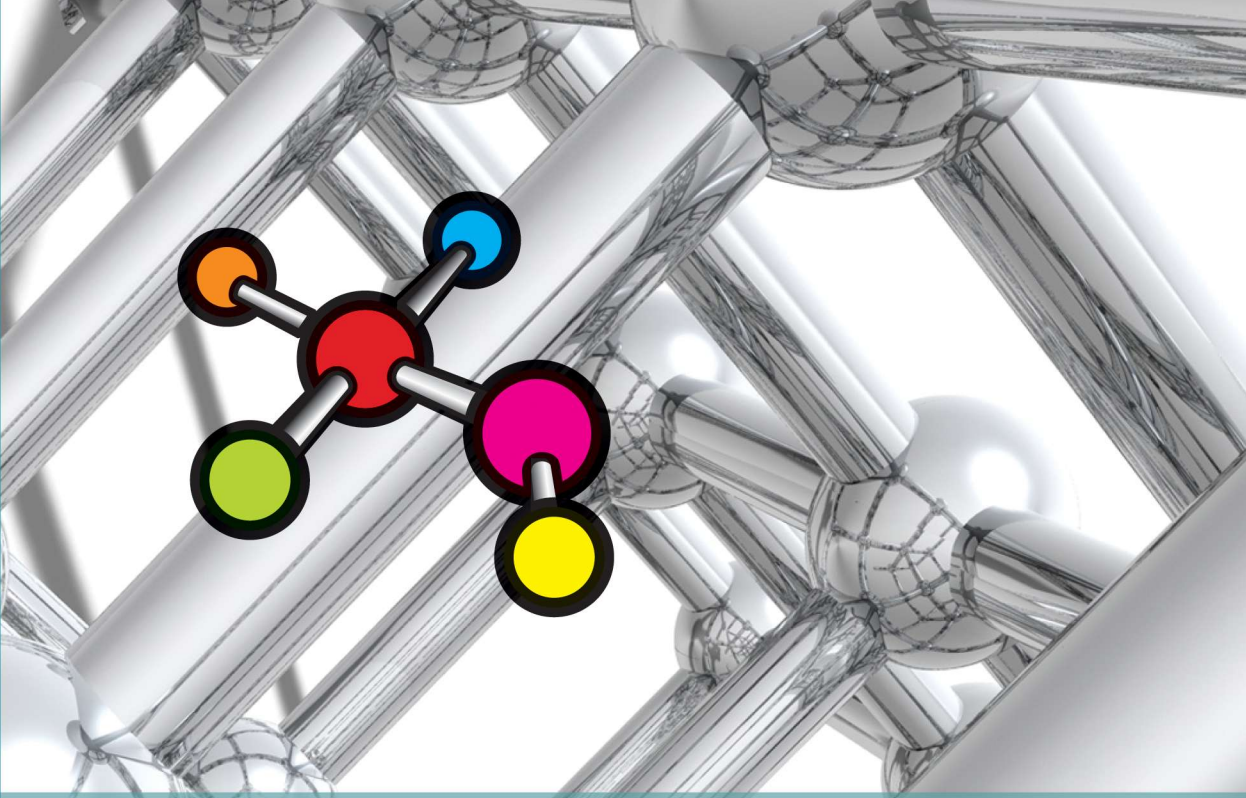

XXI Encontro Nacional SPQ

Química e Inovação

11 a 13 de Junho de 2008

Faculdade de Engenharia da Universidade do Porto

SPQ

PREPARATION OF HIGHLY MESOPOROUS CARBON CATALYSTS FOR WET OXIDATION OF ANILINE

Purnakala V. Samant[a], Helder T. Gomes[a,b]*, José L. Figueiredo[a], Joaquim L. Faria[a]

[a]*Laboratório de Catálise e Materiais (LCM), Laboratório Associado LSRE/LCM, Departamento de Engenharia Química, Faculdade de Engenharia, Universidade do Porto, Rua Dr. Roberto Frias, 4200-465 Porto, Portugal*

[b]*Departamento de Tecnologia Química e Biológica, Escola Superior de Tecnologia e de Gestão do Instituto Politécnico de Bragança, Campus de Santa Apolónia, 5300-857 Bragança, Portugal*

**htgomes@ipb.pt*

Carbon xerogels were synthesized from different organic precursors in order to obtain materials with high surface area and well developed mesoporosity. In addition, oxygen surface groups were introduced on these materials by proper chemical or thermal treatments. In a previous work [1] we have shown that mesoporous carbon xerogels with proper surface chemistry could be efficiently applied in wet oxidation reactions.

In this work, the xerogels synthesized by poly-condensation from the organic precursors resorcinol/formaldehyde (CX) and resorcinol/cresol/formaldehyde (CCX) were used as catalysts in the wet oxidation of aniline. The reaction was carried out at 200ºC and 20 bar of oxygen partial pressure. The textural properties and surface chemistry of the synthesized carbon materials, as well as the catalytic results obtained with them are given in Table 1.

Table 1. Textural properties, surface chemistry and catalytic results obtained.

Sample	S_{BET} (m^2/g)	S_{meso} (m^2/g)	CO ($\mu molg^{-1}$)	CO_2 ($\mu molg^{-1}$)	$X_{ANL,\ 60\ min}$ (%)	$S_{NOC,\ 60\ min}$ (%)
CX	724	524	709	217	94	84
CCX	475	117	1565	516	96	58

Analysis of the textural properties of both materials shows that CX is highly mesoporous in contrast with the modest mesoporosity of CCX. On the contrary, the surface chemistry of CCX is more pronounced than that of CX. Comparing their catalytic performance, it was found that CX is an efficient catalyst for the degradation of aniline, high activity and high selectivity to the formation of non-organic compounds being obtained. The influence of texture and surface chemistry on the catalysts efficiency will be discussed. The activity of CX was assigned to the amount and nature of oxygen functional groups present at their surface, while the selectivity reflects the textural properties of the material.

Acknowledgments: FCT (POCI/58252/EQU/2004, POCTI/1181/2003)

[1] H.T. Gomes, B.F. Machado, A. Ribeiro, I. Moreira, M. Rosário, A.M.T. Silva, J.L. Figueiredo, J.L. Faria. *J. Hazard. Mater*. (2008) doi:10.1016/j.jhazmat.2008.02.070.