

ACTIVATED CARBONS FROM MDF AND PB WOOD COMPOSITES - POWDER AND MONOLITH FORMS

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Activated carbons (ACs) have been one of the most important materials used all over the world for centuries and they are nowadays, in the adsorption field, one of the most relevant. These adsorbent materials have multiple applications, from the food and beverage fields, to the health and industrial areas, and they play a crucial role in our society. In particular, academic and industrial communities keep their attention in the valorization of different types of wastes, such as lignocellulosic and synthetic polymers, to produce ACs, an added value material [1,2].

The focus of this work is to compare the structural and chemical characteristics of powder and monolith forms of ACs produced, Figure 1, by physical activation with CO₂, using medium density fibreboard (MDF) and particleboard (PB) engineered wood composites wastes as precursors. The information obtained allows us to predict the best application type for each of the forms of the final AC. All the samples and respective precursors were characterised by thermogravimetric analysis, lignocellulose content, nitrogen adsorption at 77K, FTIR, CHNS-O elemental analysis and determination of pH of point of zero charge.

With this work, we expect to give a positive contribution to the discussion around the thematic of the optimal size of the precursor and, in particular, to the production of ACs of large size, namely monolith perforated AC structures.

Acknowledgments. This work was supported with national funds through Fundação para a Ciência e Tecnologia (FCT, Portugal) and co-financed by Fundo Europeu de Desenvolvimento Regional (FEDER) through Programa COMPETE – Programa Operacional Fatores de Competitividade (POFC), in the scope of the projects EXPL/AAG-REC/1181/2013 (FCOMP-01-0124-FEDER-041551) and UID/QUL/0619/2016. Authors furthermore acknowledge SONAEINDUSTRIA for the supply of the wood composites.

- [1] H. Marsh, F. Rodríguez-Reinoso, *Activated Carbon*, Elsevier Science & Technology Books, London, 2006.
[2] UNECE/FAO *Forest Products Annual Market Review*, 2013-2014, United Nations Publications, Geneva, 2014.



Figure 1. Typical appearance of ACs prepared from MDF precursor in different physical forms (a) powder b) monolith).