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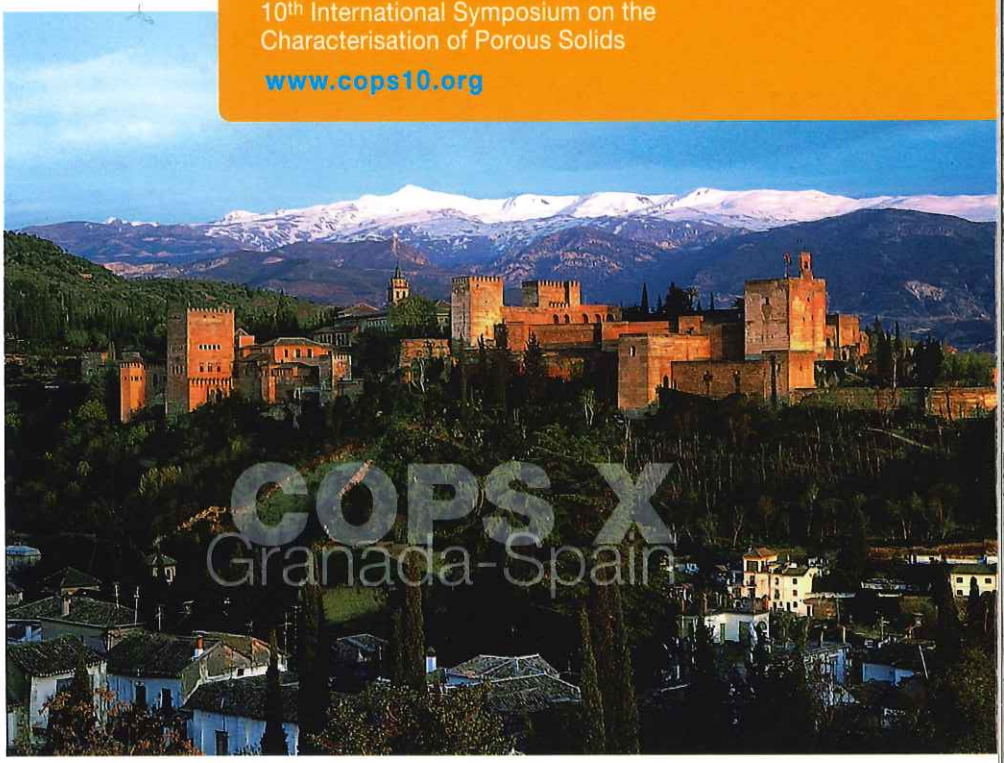

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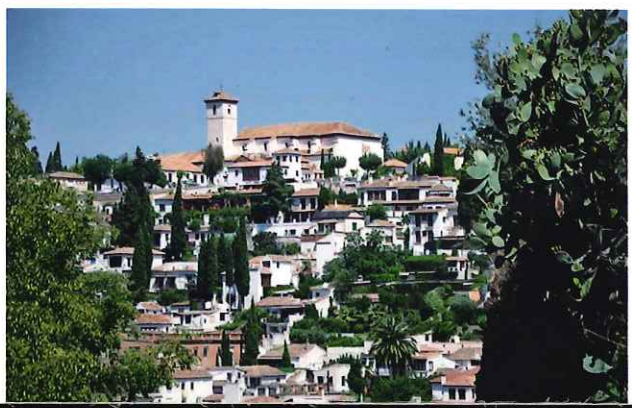

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B78 Preparation of MgO-templated carbons from waste polymeric fibres

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More than 300 million tons of tyres are discarded every year wordwide. All the materials used in tyre compounding are totally recyclable. Tyre recycling plants produce a fluff consisting of a mixture of polymeric fibres and rubber particulates that cannot be further separated and is disposed of at landfill sites. This fluff comes from the textile fibres used as reinforcement in tyres [1]. Pyrolysis is a process that allows the decomposition of waste tyres into gas, pyrolytic oil and char, all of which are highly useful products. The oil and gas could be used to generate the energy needed to operate the recycling plant itself while the char could provide porous carbons with high surface area for use as adsorbents of pollutants [2]. Mesoporous activated carbons can be prepared from tyre wastes by means of pyrolysis followed by physical activation. An alternative method that has been studied in the present research work is the preparation of adsorbents using MgO as a template.

The template synthesis of materials yields porous materials with a controlled structure by a simple procedure. In this case however, a precursor of MgO is necessary such as magnesium citrate, magnesium acetate, magnesium gluconate, magnesium hydroxyl-carbonate or MgO itself [3, 4].

The aim of the present work was to compare the texture and surface chemistry of mesoporous activated carbons with a burn-off 65% with MgO-templated carbons produced from reinforcing fibre derived from scrap tyres and its blend 1:1 with a bituminous residual waste to determine the best way to obtain mesoporous carbons with a high surface area.

Nitrogen adsorption and Hg porosimetry were carried out to study the texture of the carbons while the point of zero charge (pH_{pzc}), temperature programmed desorption (TPD), X-Ray Photoelectron spectroscopy (XPS) and Scanning electron microscopy (SEM-EDX) were used to study the surface chemistry.

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