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Zeolite-Templated Carbon: a Promising Material for Supercapacitors

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Chemical vapor infiltration (CVI) of a hydrocarbon in a molecular sieve is a synthesis technique used to generate a crystalline structure of carbon that remains up to now purely theoretical: Schwarzite [1-2]. This structure has indeed been foreseen as a promising material to manufacture electrodes for supercapacitors. Nonetheless, many technological challenges still have to be overcome in order to make this synthesis technique more accessible [1].

The molecular sieve that was selected for this study is zeolite, for its extraordinary adsoption properties. Zeolite is used as a template: the aim is to replicate its structure by infiltrating carbon atoms inside the nanopores [3]. The idea is to obtain, after zeolite dissolution by means of hydrofluoric acid treatment, a material that is exclusively composed of carbon, with a 3D porosity network consisting of nano-sized pores and thus displaying a high specific surface (see figure1).

SEM observation shows that the obtained material has a very similar structure to that of the initial zeolite (see figure 2) which augurs well for the successful replication of the zeolite structure.

Therefore, the presentation will focus on the synthesis and characterization of these materials, using thermogravimetric analysis, X-Ray diffraction, Raman, etc.

Figures

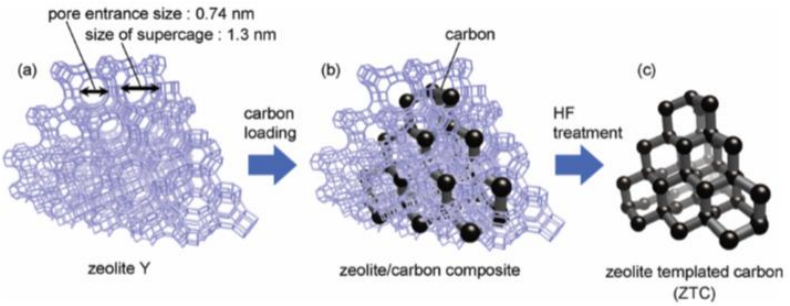

Figure 1 : *: Schematic Zeolite-Templated Carbon (ZTC) Synthesis [3]*

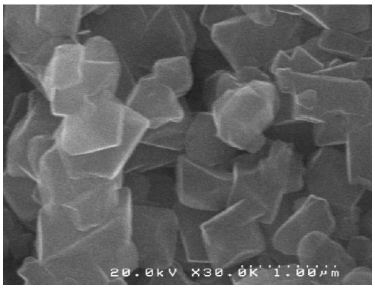

Figure 2 : *SEM image of carbon material obtained after zeolite dissolution with hydrofluoric acid*

References

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