



## Design of porous materials derived from industrial non-hazardous

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### Background

Environmental pollution and large-scale waste generation are two of the main problems that affect modern society, highlighting the need to implement policies to reduce PM concentrations and methods that allow recycling to minimise wastes' environmental impact. SUNSPACE ("SUSTaiNable materials Synthesized from by-Products and Alginates for Clean air and better Environments") is the first porous material realized from industrial by-product, silica fume, to depollute urban areas reducing PM concentrations.

### Objectives

Research activity will be designed to improve SUNSPACE characteristics through different steps: the colour change, to obtain a lighter coloured material than SUNSPACE; the improvement of mechanical strength and the elimination of thermal treatment.

### Methodologies

The colour change can be achieved through the substitution of silica fume with bottom ash, solid residue of municipal solid waste incineration plant. Others pore formers will be used, instead of sodium bicarbonate, to eliminate the thermal treatment. Finally, adsorption tests will be performed, for the first time, with an aerosol nanoparticles generator to control the PM flux.



FIGURE 1. SUNSPACE CAPACITY TO ENTRAP PM.

### Expected Results and Impact

The achievement of these results would favour the industrial scale development of the material to depollute urban areas.