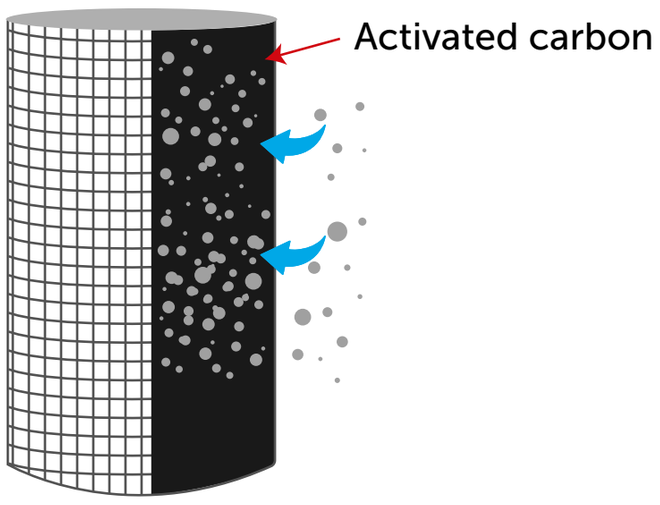
A New Affordable and Sustainable Hybrid Material to Reduce Air and Water Pollutants

Current gold standard adsorbent



- ✓ High adsorption
- ✗ Expensive
- ✗ Disposal of end-of-life sorbent
- ✗ Poor regeneration

What is a suitable alternative?

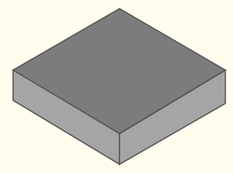
Synthesis

Sodium alginate
(naturally abundant)

+

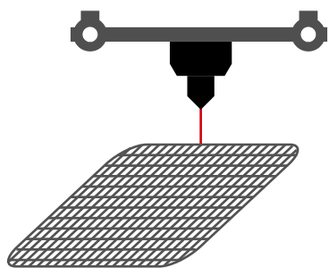
Silica fume amorphous
(industrial byproduct)

=

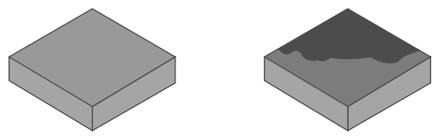


Hybrid

Benefits of new hybrid material

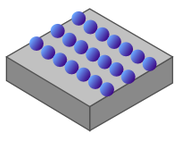


3D printing
Used for water filtration

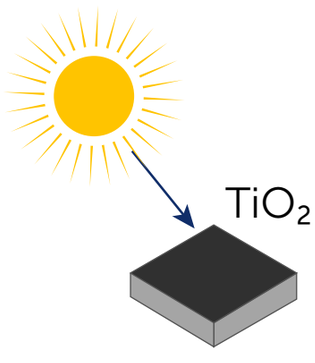


Particulate matter trapping
Reduced air pollution

Sustainable
Lower carbon footprint



Adsorption
High organic dye adsorption efficiency



Photodegradation
Good photodegradation performance with titania coating

Flexible application
Brush, coat, spray or 3D-print

A new class of sustainable hybrid materials made from solid wastes and naturally abundant polymers can reduce water and air pollution more efficiently than activated carbon

A new porous hybrid material derived from silica fume and alginate for sustainable pollutants reduction
Elza Bontempi et al. (2018) | Frontiers in Chemistry | DOI: 10.3389/fchem.2018.00060