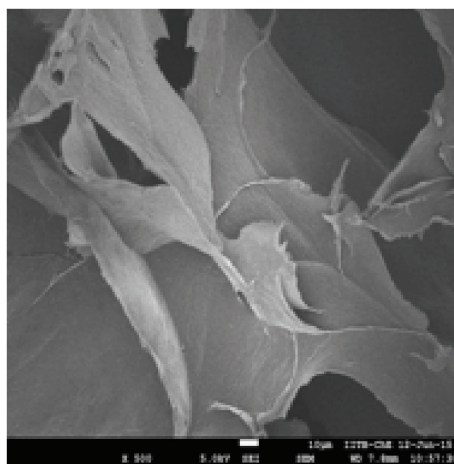


3D graphene adsorbent for water treatment

Graphene is a very active adsorbent due its polycyclic aromatic structure and hence can be used for removal of harmful pollutants such as dyes, heavy metals, pesticides and antibiotics from water. It can be most conveniently used in the form of three dimensional graphene (3D graphene). For example, plugs of 3D-graphene (see figure) can be stacked into point-of-use water treatment devices. Key point of the technology is to produce 3D graphene with fully exfoliated single-sheets of graphene. Such a material has both very high surface area and activity.

By optimisation of the synthesis route, we have been able to prepare single-sheet graphene as seen from the micrograph in the top-right inset. Silver nanoparticles loaded on this graphene resulted in 3D graphene with very high antibacterial activity.



(a) Plug of 3D graphene (b) High resolution scanning electron micrograph showing graphene sheets in the 3D-plug. The central micrograph shows 3D graphene with impregnated silver nanoparticles.