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## Development of biomorphic alumina using egg shell membrane as bio-template

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### Abstract

Hierarchical interwoven alumina was developed using egg shell membrane as a bio-template. Fibrous network of the egg shell membrane was replicated to form fibrous alumina networks by soaking the membranes in metal salt solution and by subsequent calcination. The synthesis was systematically studied by varying the calcination temperature (400 - 1200 °C). Morphological features of the developed alumina networks were characterised using electron microscopes and structural investigations were carried out using X-ray diffractometer. Surface features of the hierarchical structures developed were also studied. Calcium and sulfur based compounds got crystallized from egg shell membranes along with alumina. The developed biomorphic networks by virtue of their high surface area and porous properties will be potential candidates for applications in water purification.

### Keywords

Alumina, Fibrous networks, Egg shell membrane, Biotemplate

### 1. Introduction

Nature often fascinates us with its structural complexities, which we find in features that are nanoscale on one side and having self-organisation in space on the other extreme side. Many natural materials around us have complex structures to achieve certain desired functionality and these complex structures are harnessed by using them as templates for developing hierarchical structures for a wide variety of applications [1–3]. In this respect egg shell

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