

**A novel silica/activated carbon/nano eggshell composite filter for water treatment**

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**ABSTRACT**

A novel composite filter was made for water filtration. A composite filter with silica, activated carbon and eggshell nano particles was fabricated using gel casting technique. The filter was characterized with SEM-EDAX and XRD analysis for elemental and morphological analysis. The dye adsorption test was conducted with the aid of UV-vis spectroscopy. The TDS concentration was also checked. The morphology analysis revealed that there are plenty of pores present all over the surface. The pores size varies from few microns to nano. Presence of activated carbon, silica and eggshells particles was confirmed through XRD and EDX analysis. UV-vis Spectroscopy results revealed that the prepared filter sample reduced the concentration of dye in the water solution hugely. The filtration through the composite filter reduced TDS concentration in water and also made the water from slight acidic to basic. The use of composite filter purifies the polluted water and converts it into potable water.

*Keywords: Water filtration; SEM; Activated carbon; eggshells; nanoparticle.*