

Photocatalytic Degradation of dye using CuS thin films developed by CVD method on glass substrate

Textile industry represents a pollution problem worldwide due to the accidental discharge or dumping of polluted wastewater into the waterways, which is having a major influence on the quality of water resources. Around 17–20% of industrial water pollution arises from textile dyeing and treatment. This represents a large environmental challenge for textile manufacturers. With growing environmental awareness, there is a need for environmentally-friendly technology to remove dyes from the industrial and local wastewater. The photo decolorization of dyes is considered as a favorable technology for industrial wastewater treatment techniques owing to its environmentally friendly method, low cost, and lack of secondary pollution. The efficiency of photocatalysis system depends on the operational parameters that govern the adsorption and photodegradation of dye molecules. The findings showed that various parameters, like initial pH of the solution to be degraded, photocatalyst concentration, reaction temperature, dye concentration and dopants content exert their individual influence on the photocatalytic degradation of any dye.

In view of above there was a need to develop CuS thin film over a cost effective substrates such as glass, quartz or metallic sheets using a single source precursor. This CuS thin film /coatings can be used for photocatalytic activity without imposing any side effect and also it can be used for several times. DMSRDE, Kanpur has developed Thiourea Copper (II) precursor and a process for preparation of CuS thin film in bulk using the single source precursor tetra thiourea complex under improved CVD process by controlling temperature under inert atmosphere. The developed CuS thin film shows excellent photocatalyticdegradation of organic dyes which are serious causing of water pollution through industrial wastes.