

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.

Interested Industries are requested to forward their Expression of Interest (EoI) to Director DMSRDE, Kanpur (with attachments of supporting documents) with a copy of Director DIITM, DRDO HQ (without attachment) on following address:-

To,

Director

Defence Materials and Stores Research & Development Establishment (DMSRDE)

DRDO, Ministry of Defence, Government of India
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Copy to

Director

Directorate of Industry Interface & technology Management (DIITM)

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Fax: 011-23793008

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List of Support documents to be attached with EoI

- a) Memorandum and Articles of Association (Should be incorporated as per Indian Companies Act, as amended time to time)
- b) Certificates of registration as a manufacturing unit, if any.
- c) Audited Balance Sheet for the preceding three years.
- d) Income Tax returns for the preceding three year period
- e) Details of shareholding/ownership pattern especially foreign partners/ shareholders, foreign employees, directors, etc. The company must adhere to the prevailing Govt of India policies and regulations on Foreign Direct Investment (FDI)/DIPP norms as applicable.
- f) Annual budget for R&D during last three years.
- g) Numbers and details of IPR or patents, etc., held by the company.
- h) Number of technically or professionally qualified personnel.
- i) Record of past performance (e.g., Supply orders executed against of Ministry of Defence orders, Public Sectors and Paramilitary Forces, if any).
- j) Availability of adequate infrastructure (List of machines and their production capacities) and technical expertise.
- k) List of Testing and Support equipment's

- l) ISO/ ISI certification or any other certification
- m) Relevant clearances from the authorities/ ministries (if any)
- n) Capacity and capability to undertake developmental work and to accept attendant financial and commercial risks.
- o) Capacity/capability to market the product through the marketing network, sales and service network, reliability to maintain confidentiality.
- p) PESO and DPIIT license for explosive handling if ToT is for high energy Material, explosives, propellants, and component/ system dealing with it etc (if applicable).
- q) Under taking form company seeking ToT that none of its Directors, Independent Directors, non-executive Directors, Key management personnel are involved in any corrupt practices, unfair means and illegal activities.
- r) Details of the industrials license for defence manufacturing be provided by the industry seeking ToTs.