

## Process control & instrumentation for titanium sponge plant

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### ABSTRACT

*A large scale facility for establishing the technology of production of titanium sponge in 4000 kg batches by high temperature reduction of titanium tetrachloride has been set up at the Defence Metallurgical Research Laboratory, Hyderabad. The steps involved in the process are (i) two stage distillation for the purification of titanium tetrachloride (ii) high temperature reduction of titanium tetrachloride by molten magnesium followed by pyro-vacuum distillation of sponge in a combined reduction-vacuum distillation furnace and (iii) processing of the sponge produced which include sponge ejection, cutting, crushing and blending. To produce high purity sponge in a reproducible manner batch after batch, very close monitoring and control of process parameters is essential. In view of the highly reactive nature of the metal, any post reduction purification is totally ruled out. This paper discusses in detail the process control scheme adopted for the titanium tetrachloride purification and reduction operations, highlighting the type of instrumentation adopted considering the corrosive nature of titanium tetrachloride. A microprocessor based Distributed Control System has been installed for controlling the process operation. Salient features of this system are also described in this paper. □*