

ULTRA-PURIFICATION OF ARSENIC

Ultrapure arsenic (6N) finds extensive application in electronics industry as III-V compound semiconductors and as a dopant. Arsenic (6N pure) at present is not manufactured in India and needs import. BARC has standardized a protocol for producing 6N (99.9999%) pure arsenic from commercially available arsenic trioxide (99.9%). The product quality obtained is equal to or better than the imported product.



Process Salient Features

Purification of arsenic is carried out in clean rooms as given below to bring impurities down to ppb level.

1. Commercial arsenic trioxide is first purified by fractional sublimation under static vacuum in specially designed quartz apparatus under gradient temperature.
2. This purified arsenic trioxide is reduced to pure arsenic at high temperature under high purity hydrogen gas flow.
3. This ultra-pure arsenic is again heated under a hydrogen gas flow to remove any trace impurities and oxide layer formed, if any.

The ultrapure arsenic is sealed under high vacuum in previously degassed pyrex glass ampoules for storage.

Applications

Ultrapure arsenic is used in the manufacture of semiconductor materials such as gallium arsenide, indium arsenide, etc. which are used in high speed opto-electronic devices (gun diodes, laser diodes, light emitting diodes, etc). These applications along with doping applications have created an increased demand for high purity arsenic in recent years.