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Effect of distillation temperature on purification of Zinc

Y. Purushotham* and S. T. Ali

Centre for Materials for Electronics Technology (C-MET)
IDA Phase-III, HCL (PO), Cherlapally
Hyderabad – 500 051
*Corresponding Author, E-mail: ypurushotham@cmet.gov.in

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ABSTRACT

Zinc has many uses for mankind. It's most common use is as an anti-corrosion agent by way of Galvanization, a process of its coating on iron to protect it against corrosion. With an electrochemical potential of -0.7618 volts, Zinc makes a good material for anode in batteries. Powdered zinc is used in alkaline batteries. High purity Zinc is used for making compound semiconductors such as CdZnTe (for detectors), ZnSe (for electro-optic modulators) and for doping of semiconductors to make p-type. Compound semiconductors are usually synthesized using high purity metals typically of ~m7N purity. Presence of metallic, non-metallic and gaseous (O, N, H, etc.,) impurities diminish the electronic properties of semiconductors and affect the performance of electronic devices.

The vacuum distillation is normally used for preparation of high-pure Zn (upto 6N), followed by ultra-pure Zn (≥7N) by zone refining. Distillation allows separation of the major matrix viz. Zn (M. P. = 693 K, B. P. = 1180 K) from other impurities by vaporizing at its boiling point due to differences in saturated vapor pressures of impurities. Impurities having lower vapor pressures and higher boiling points compared to major zinc will be discarded as residue. Ultra-purification of Zinc is highly dependent on process parameters like temperature, environment and materials handling. The details of purification process would be presented.