

Sulphur rich porous material for Mercury adsorption and thermal insulation

Akhil Mammoottil Abraham

The Petroleum Institute, United Arab Emirates

The petroleum refining units produce excess amount of elemental sulfur annually via hydrodesulphurization; however the applications associated with elemental sulfur in bulk is limited except for production of sulfuric acid. Research activities contributing in finding useful applications for excess sulfur is ongoing. Here in we report a simple and versatile approach for the preparation of sulfur foam, which via a porogen and inverse vulcanization process.. Elemental sulfurs affinity for elemental mercury and its inherent non-conductive nature towards heat makes it a suitable candidate for mercury adsorption and thermal insulation. Moreover presence of pores and cross-linked structure significantly reduced the thermal conductivity of elemental sulfur. Sulfur foam with 50 wt. % co monomer showed thermal conductivity ~ 0.048 W/ m K which was within the range of commercially available insulators. Additionally, sulfur being reactive to elemental mercury sulfur foam with 20 wt. % co monomer showed an adsorption capacity ~ 151 ug/g which was within the range of commercially available carbon materials.

Biography:

Akhil Mammoottil Abraham is working as a research assistant in Petroleum Institute, Abu Dhabi (PI). He completed Bachelors in chemical engineering from NIT, Calicut, India and was awarded ADNOC scholarship for pursuing M.Sc in Chemical Engineering (2014-2016). His research focuses on developing applications for large amount sulfur, which has little economic utility. Currently, his research revolves around lithium sulfur battery, sulfur based super-capacitors and sulfur co-polymers for heavy metal sequestration.