

MECHANICAL ENGINEERING STUDENT SEMINAR

Monday, October 30 2024 at 14:30, D. Dan and Betty Kahn Building, Room 217.

Online: <https://technion.zoom.us/j/96049682013>

MASS TRANSFER OF VAPOUR IN POROUS MEDIA

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Vapor transfer in porous media is an important phenomenon relevant to applications such as natural gas exploration, mining, water vapor transport through soil layers, leakage detection, and forensics. In this study, buried or concealed sublimating materials enclosed within porous mediums are of particular interest. The vapor that diffuses from such a source inevitably undergoes partial adsorption in the surrounding medium and can also reach the free surface and be detected there.

The adsorption processes in porous media, whether chemisorption or physisorption, have been extensively studied using various materials, leading to the development of different types of adsorption isotherms to describe conditions of adsorption and desorption equilibrium. While diffused vapor is partially adsorbed in the pores, there is interest in accelerating and amplifying the release of vapor to the free surface.

Efforts were made to enhance the vapor flux reaching the free surface by minimizing its adsorption within the bulk material. Experimental studies and numerical simulations demonstrated that convective heating can substantially enhance desorption, resulting in an increased vapor flux towards the free surface and improving the chances of detection.

Note: the seminar will be given in Hebrew