

סמינר - SEMINAR

הנדך מוזמנת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום ב' 9.07.2018 (כ"ו בתמוז, תשע"ח), בבניין דן קאהן, אודיטוריום 1, 14:30.

מרצה:

Dr. C. J. Arnusch

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על הנושא:

Laser-induced graphene fabricated on porous polyethersulfone membranes as electrically active antifouling and antimicrobial filters

The seminar will be given in English

להלן תקציר ההרצאה:

Fouling is a major challenge in water purification technology that utilizes polymer membranes. Moreover, the control/elimination of microorganisms in water systems or water treatment systems is relevant in many applications. Laser-induced graphene is a three-dimensional porous electrically conductive graphene material generated by irradiation of polymer substrates with a 10.6 μm CO₂ laser.^{1,2} Here we show the exceptional properties of laser induced graphene (LIG) in membrane water treatment technology. Specifically, LIG fabricated on polyethersulfone porous substrates will be presented and these LIG-membranes were shown to strongly resist biofilm growth on the surfaces. Since the LIG-membranes are electrically conductive, an active antimicrobial action was seen using the LIG-membranes as porous electrodes during filtration of contaminated waters. These "passive and active" antimicrobial and antibiofouling mechanisms of action will be explained, including the effects of the unique surface structure of LIG. This method to "laser-print" electrically conductive graphene on membranes will enable many new applications in water treatment and separations.

1. Singh, S. P.; Li, Y.; Zhang, J.; Tour, J. M.*; Arnusch, C. J.* Sulfur-doped laser-induced porous graphene derived from polysulfone-class polymers and membranes ACS Nano 2018, 12 (1), 289–297.
2. Singh, S. P.; Li, Y.; Be'er A.; Oren, Y.; Tour, J. M.*; Arnusch, C. J.* Laser-Induced Graphene Layers and Electrodes Prevents Microbial Fouling and Exerts Antimicrobial Action ACS Applied Materials and Interfaces 2017, 9 (21), 18238-18247.

מארח: פרופ"מ מתיו סאס

בברכה,

מרכז הסמינרים
מ"מ אית'ו סאס