

סמינר - SEMINAR

הנד מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום ד' 28.10.15 (טו' בחשון, תשע"ו), בבניין דן-קאהן, קומה 0, באודיטוריום 1 בשעה 14:30.

ירצה:

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Director

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על הנושא:

Size-selective Analysis of Nanoparticles from Diesel Engine with Fuel Tracing

להלן תקציר ההרצאה:

The nanoparticles (ultra-fine particles) from IC-engines and especially from Diesel engines are an important component limited by exhaust gas legislation and considered for the health and environment protection. In the discussions about health-effects there is always the question about the composition of the nanoparticles.

The presentation shows the procedures and results of size-selective analysis of nanoparticles composition from a heavy-duty diesel engine for construction machinery.

Three variants of fuel additizing were applied to allow the balances of certain tracer-substances after the tests: 2% of additives-free lube oil; 2% of market lube oil with additive package and Fe-based regeneration additive (FBC) with 40 ppm Fe.

The analysed SMPS particle size distributions indicated that by blending the market lube oil with the fuel the combined effects of metals or metal oxides from the additive packages and of the heavy hydrocarbons from the lube oil matrix contribute the most to the increase of particles nuclei mode.

The size-selective masses of the nanoparticles were collected on the stages of ELPI cascade impactor and they were analysed by means of inductively coupled plasma mass spectrometry ICP-MS.

From the masses of Fe, Zn and Ca, which were introduced with the fuel, only parts were found as integral masses at all ELPI-stages – Fe 43.5%, Zn 36.6%, Ca 65.5%.

The majority of mass of some metals, or metal oxides emissions on ELPI-stages (up to 80%) is in the size ranges below 100 nm.

The presence of metals and metal oxides as solids in the lowest size range (nuclei mode) is relevant for the consideration of health effects. Higher lube oil consumption of the engine is a negative factor for the nanoparticles emission.

בברכה,

2015/11/11 א.א.י. ל.ת
מרכז הסמינרים

המארח: ד"ר לאוניד טרטקובסקי