

第703回 化学・物質工学セミナー 開催のお知らせ

この化学・物質工学セミナーは、「国際的な活躍が期待できる研究者の育成事業」第7回特別講演および第11回重点研究課題講演会と共催します。万障お繰り合わせの上、ご参加下さい。

Recent progress on multidimensional gas sensors – in-situ electrical and optical characterization

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記

日時：平成31年2月5日（火）16:10～17:40

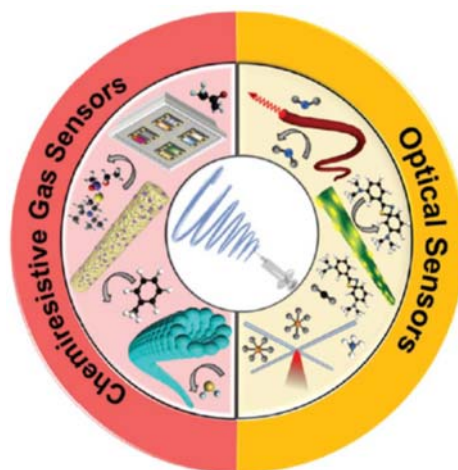
場所：総合教育研究棟2階 多目的ホール

アメリカ合衆国のマサチューセッツ工科大学のHarry L. Tuller教授は、電池、燃料電池、太陽電池、光分解セルやセンサ等のエネルギー関連デバイスのプロセッシング、キャラクタリゼーションおよび機能設計法に関する研究を精力的に進めておられます。今回の講演では、ガスセンサ材料についての最近の研究成果をご講演いただきます。

Abstract

Chemical sensors have long been viewed as having the potential to impact many fields and technologies including emissions detection and control, workplace safety, healthcare, airport security, and process control. The key challenges such devices must overcome are satisfying the needs for adequate sensitivity, selectivity, stability, speed and ultimately cost. Semiconducting and electrolytic based oxides, in principle, satisfy many of these criteria, but only when appropriately functionalized by catalysts and/or prepared in multiscale configurations. Alternative technologies depend rather on resonant nano-balances that detect mass changes associated with adsorption of gases. Optical detection provides yet another orthogonal means for detecting gaseous species. In this presentation, I present an overview of research performed by us, often in collaboration with others, investigating the response of (1) novel semiconducting oxides, prepared in nanoscale 1D, 2D and 3D configurations, and functionalized with catalysts, (2) micromachined resonant nano-balance arrays and (3) gas sensitive optical materials that respond to various gaseous chemical analytes. In each case, I will focus on the underlying principles of operation and the challenges that need to be addressed to further improve performance.

Figure from: *Macromol. Mater. Eng.* 2017, 302, 1600569



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