疎水性極限濃度色素液体材料に基づく高性能化学センシング系の設計

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Design of high-performance chemical sensing system based on hydrophobic extreme concentration dye liquid material (*Graduate School of Engineering, Osaka Prefecture University*)○Hideaki Hisamoto

In this lecture, high-performance chemical sensing using "dye liquid", a new material that liquefies dye molecules as ionic liquids, which was conventionally known to be in the form of solid powder, will be presented. Since the dye liquid is an extremely concentrated dye and at the same time has fluidity, it is possible to realize high sensitivity and fast response of the liquid film type sensor by ultra-thin liquid film preparation. Furthermore, highly-efficient fluorescence resonance energy transfer (FRET) can be possible by using fluorescent donor dye liquid containing small amount of fluorescent acceptor dye. Here, we present recent results on high-sensitivity sensing of anions including heparin, [1), 2)] calcium ions, [3), 4)] and FRET-based sensing of chloride ions. [5)] For calcium ion sensing, highly-sensitive sensing by combining photonic crystal structure will be also presented. [4)]
Keywords : Ionic Liquid; Plasticized PVC; Optical Sensor; Ion Sensor; FRET

本講演では従来固体粉末状であることが常識だった色素分子をイオン液体として液化した新材料、「色素液体」を用いた高性能化学センシングについて、最近の成果を発表する。色素液体は極限的に高濃度化された色素であると同時に流動性を持つ液状のため、超薄液膜化により液膜型センサー応答の高感度・高速化を実現できる。ここではアニオンおよびヘパリン [1), 2)]、カルシウムイオン [3)]、フォトニック結晶構造を組み合わせた高感度カルシウムイオンセンシングデバイス [4)]、および蛍光共鳴エネルギー移動を用いる塩化物イオンの高感度センシング [5)]についての成果を発表する。

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