

課題番号 : F-16-UT-0027  
 利用形態 : 機器利用  
 利用課題名(日本語) :  
 Program Title (English) : Parylene-based MEMS Gas Sensor for High-Sensitivity VOC Detection  
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## 1. 概要(Summary)

Micro gas chromatography has attracted increasing attention due to the compactness and portability for various applications. Among different types of gas detectors, the chemicapacitive one has promising features of the fast response with simple electrical interfaces and low power consumption. Unlike other common material, e.g., PDMS, parylene films can be coated uniformly by chemical vapor deposition (CVD) process. As a first step toward a new design of the chemicapacitive sensor, we benchmarked parylene films as the vapor-sorption layer in the present study. VOC sensing performance of parylene E has been characterized using fringe-field type gas sensors.

## 2. 実験(Experimental)

### 【利用した主な装置】

高速大面積電子線描画装置, マスク・ウエーハ自動現像装置群, ステルスダイサー, ブレードダイサー

### 【実験方法】

Glass mask is made using F5112+VD01. TEMPAX wafers were cut into chips by DISCO DAD3650 after standard photolithography. Silicon wafers were cut into chips by DISCO DFL7340 after photolithography.

## 3. 結果と考察(Results and Discussion)

Fig. 1 shows the images of the prototype sensors deposited with parylene E. The sensing performance was evaluated against toluene vapor. Fig. 2 shows the equilibrium capacitance change. It is found that a good linearity is obtained in the

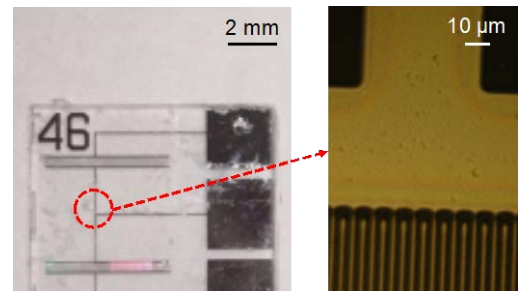


Fig. 1 Images of the fabricated gas sensors.

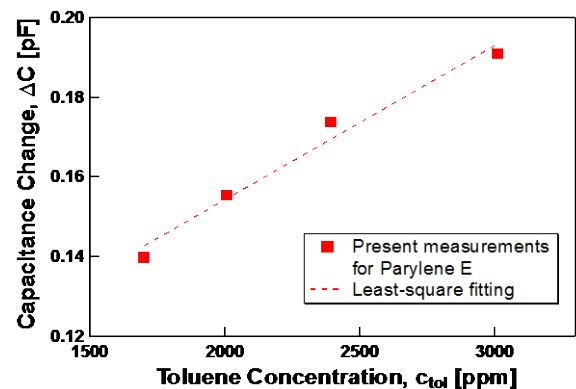


Fig. 2 Capacitance change versus the toluene concentration.

present measurement range. Also, larger sensitivity is obtained for parylene E than the case for PDMS.

## 4. その他・特記事項(Others)

なし

## 5. 論文・学会発表(Publication/Presentation)

(1) C.-H. Yeh et al., Int. Symp. Micro-Nano Sci. Tech. 2016, Tokyo, SaA1-B-3 (2016).

## 6. 関連特許(Patent)

なし