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1. 概要（Summary）

Thin film single-walled carbon nanotubes (SWNTs) field effect transistors (FETs) have already attracted intense interests, due to the fascinating properties of SWNTs. Therefore, a simple and low cost preparation method of thin SWNTs film is essential for large scale production. The fabrication of SWNTs FET devices is the most efficient way to examine the performances of thin SWNTs films. Here we fabricated thin SWNTs film FET devices using photolithography procedures.

2. 実験（Experimental）

【利用した主な装置】

　光リソグラフィ装置 MA-6

【実験方法】

The exfoliated thin SWNTs film was transferred using PDMS onto the silicon substrate. The source/drain electrodes were patterned on the thin SWNTs film/SiO_2/Si substrate using a standard photolithography process. The Au/Ni electrodes were deposited in high vacuum condition using thermal evaporator with a quartz crystal thickness meter. Subsequently, the second photolithography step was adopted to remove SWNTs film exclusive of the channel region between source and drain by exposing the sample oxygen plasma.

3. 結果と考察（Results and Discussion）

The SWNTs on the SiO_2/Si substrate are applied back gate voltage by the highly p-doped Si layer. Figure 1 shows corresponding optical microscopy image of SWNTs/SiO_2/Si substrate (100 nm thick SiO_2 layer). The channel length between the source/drain electrodes is 30 µm (width = 50 µm). Semiconductor properties have been observed in the transfer and output characteristics of SWNTs device.
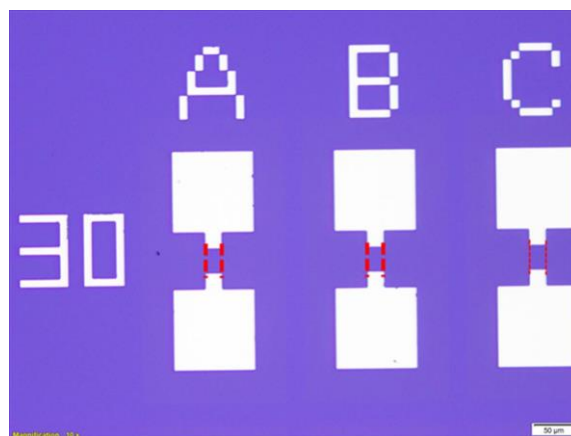

Figure 1. Optical microscopy image of thin SWNTs film FET devices

4. その他・特記事項（Others）

5. 論文・学会発表（Publication/Presentation）

なし。

6. 関連特許（Patent）

なし。