

課題番号 : F-14-HK-0040
 利用形態 : 機器利用
 利用課題名(日本語) : 自然免疫のナノ領域での機能解明
 Program Title (English) : Investigation of function of natural immunity on the nano-level
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1. 概要(Summary)

In order to conquer the “pressure gap” of the electron microscopy and take an observation under atmospheric/liquid environment, we intend to develop a special environmental cell using graphene as the window material. The research comprises of the synthesis of graphene and the micro manufacturing of Si substrate which is used as the main platform of the environmental cell.

2. 実験(Experimental)

XRD Single-crystalline Cu(111) film as the substrate (catalyst) for growing graphene, was deposited on Al₂O₃(0001) via thermal evaporation. XRD was used to check the crystallinity of the film.

Laser lithography, RIE Micro manufacturing of Si substrate was carried out following the resist-assistant selective etching. Resist layer (OFPR) was coated on the top of Si, followed by the pattern drawing by the laser lithography. Then the top SiN layer was etched by RIE, leaving the bared Si exposed, which was etched by KOH later.

3. 結果と考察(Results and Discussion)

Figure 1 shows the XRD ϕ -scan profiles of the Cu(111)/Al₂O₃(0001). The peaks were observed periodically with an interval of 60°. The uniform intensity of the peaks, with an FWHM of ~0.9°, indicates that the Cu film was single-crystalline along (111) pole.

Figure 2 shows the optical micrographs of the Si substrate after RIE (left) and KOH etching (right). The RIE etched the Si exactly followed the original design (262 μ m). However, after KOH etching, the

square window was a little larger than the original design (50 μ m), probably due to the inappropriate condition of KOH etching.

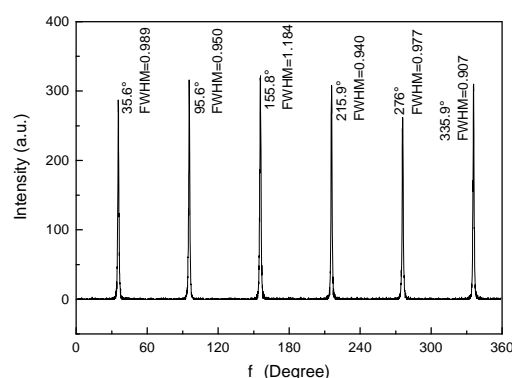


Figure 1. ϕ -scan of the Cu(111) film.

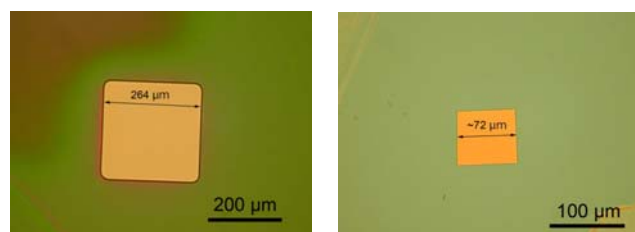


Figure 2. The optical micrographs of Si substrate after RIE (left) and KOH etching (right).

4. その他・特記事項(Others)

None

5. 論文・学会発表(Publication/Presentation)

None

6. 関連特許(Patent)

None