課題番号	：F-16-AT-0125
利用形態	：機器利用
利用課題名（日本語）	：半導体材料の評価
Program Title (English)	：Evaluation of semiconductor materials
利用者名（日本語）	：ニコラ ゴセ
Username (English)	：N. Gosset
所属名（日本語）	：株式会社エア･リキード･ラボラトリーズ
Affiliation (English)	：K.K. Air Liquide Laboratories

１．概要（Summary）

Purpose of this study was to evaluate impacts of dry etching processes on usual semiconductor material surfaces.

２．実験（Experimental）

【Experimental set-up】

走査プローブ顕微鏡 2(SPM2)[SPM-9600・9700] (AFM mode)

【Samples and analysis】

AFM measurements were performed on semiconductor sample surfaces before and after etching processes. Tapping mode with a 7 nm radius tip was used.

３．結果と考察（Results and Discussion）

AFM measurements were performed on semiconductor materials (SiO_2, SiN, poly-Si, a-C…) before and after etching. The figure 1 shows RMS results obtained after etching processes using two different gas mixtures.

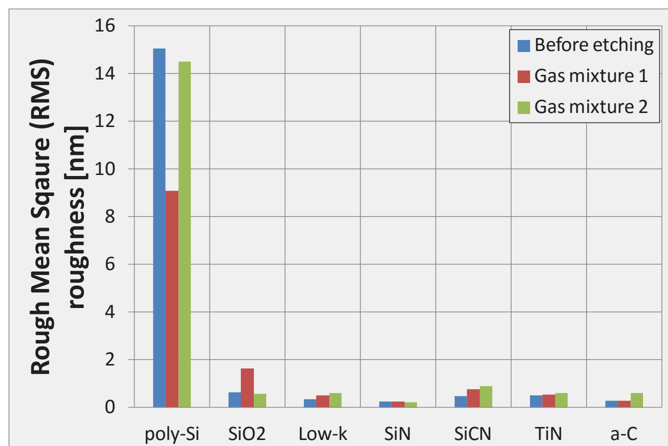

Fig. 1 RMS roughnesses of surfaces before and after etching by different gas mixtures.

We can see on figure 1 that etching processes using both gas mixtures are able to preserve surfaces from significant damages. Especially in cases of poly-Si and SiN, lower RMS roughnesses than original ones are observed after etching.

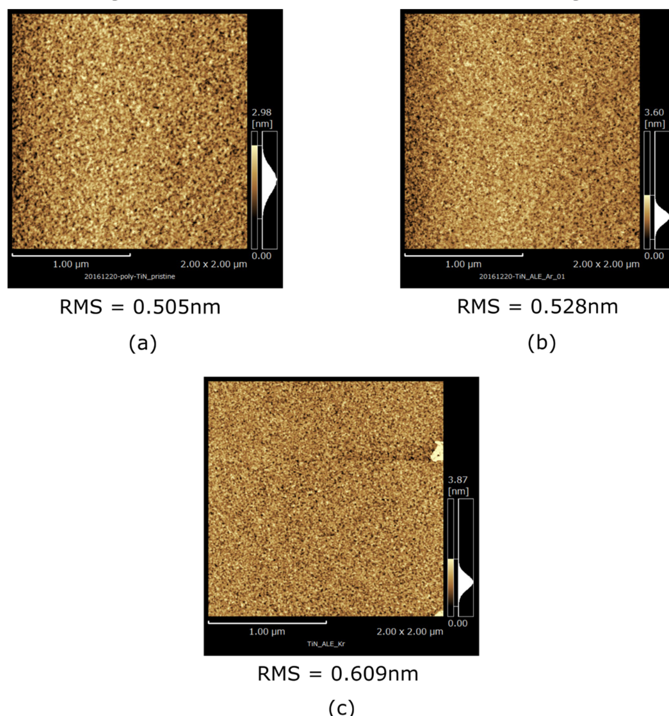

Fig. 2 AFM images of TiN surface (a) before etching, (b) etched with gas mixture 1 and (c) etched with gas mixture 2.

Figure 2 illustrate case of TiN. As we can see, even if after etching roughness is slightly increasing, surface morphology remains very close from the original one (no visible damages).

４．その他・特記事項（Others）

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５．論文・学会発表（Publication/Presentation）

なし。

６．関連特許（Patent）

なし。