

Effects of pre- surface treatment of Ni foil on NiO nanorods and nanowire-mixed nanoplates synthesized by thermal oxidation

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1. 서론

Nickel oxide nanowires and nanoplates have been attracting a growing number of concerns because of their potential applications e.g. catalysis electrochromic windows, battery, cathodes electrochromic films, fuel cell electrodes and sensors. Those structure were successfully prepared by thermal oxidation of Ni foil. However, the influences of pre-surface treatments of Ni foil on NiO nanostructures after thermal oxidation are still big issues. In this study, NiO nanowires (10-12nm in diameter) and nanowire-mixed nanoplates were synthesized by heating Ni foils at 540°C for 24h which had been scratched by sand paper and knife, and dipped in HNO₃ solution. In addition, possible growth mechanism and effect of the pre- surface treatment on the nanostructures of NiO were proposed and discussed.

2. 본론

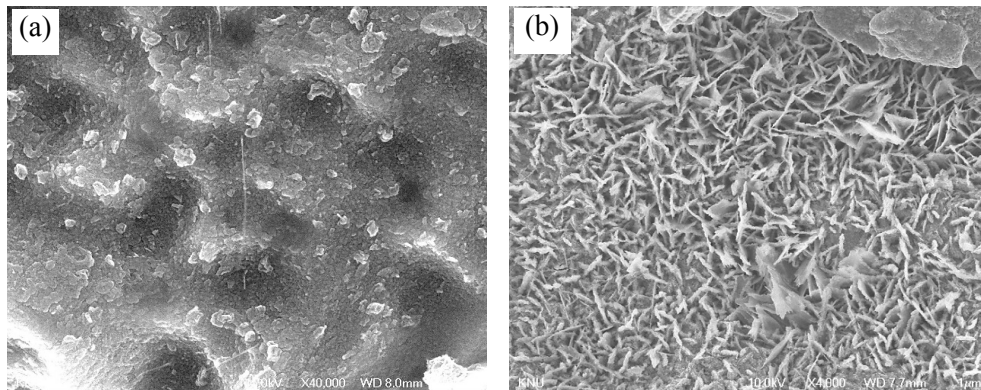


Fig. 1. NiO nanorods (a) and NiO nanowire-mixed nanoplates (b) synthesized by thermal oxidation.

3. 결론

NiO nanowires, 10-12nm in diameter and 800-1200nm in length were grown at 540°C for 24h on Ni foil which was dipped in HNO₃ for 10min. In addition, NiO nanowire-mixed nanoplates, 1-2µm in plate size were synthesized at the same conditions on Ni foil which was scratched by knife. The growth mechanism was followed the solid-liquid-solid mechanism. In this proposal, surface damage is the key factor influencing structure orientation of NiO on the surface and then the growth direction of the nanowires as well as the nanowire-mixed nanoplates.

참고문헌

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