Poster

Growth of the α-Fe_2O_3 nanowires by oxidation of iron films

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α-Fe_2O_3 (hematite) is a semiconductor (Eg=2.1eV) and the most stable iron oxide under ambient environment.[1] The applications of α-Fe_2O_3 nanomaterial were extensively studied for water splitting,[2] photocatalysts/catalyst,[3] solar cell,[4] field emission devices[5] and field effect transistors (FET).[6]

In this study, we demonstrate a rapid and easy method to synthesis α-Fe_2O_3 nanowires. The density of the α-Fe_2O_3 nanowires were successfully control by different thickness of Fe thin film within 10 hours by thermal oxidation at 350 ^oC in oven. The three iron films were of 50nm, 100nm and 150nm thickness. We found that more nanowires can be growth while the iron film was thicker. Observations using field-emission scanning electron microscopy revealed α-Fe_2O_3 nanowires with different density, and uniform diameters of 10-30 nm. (Fig. 1a, 1b and 1c)

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Figures:

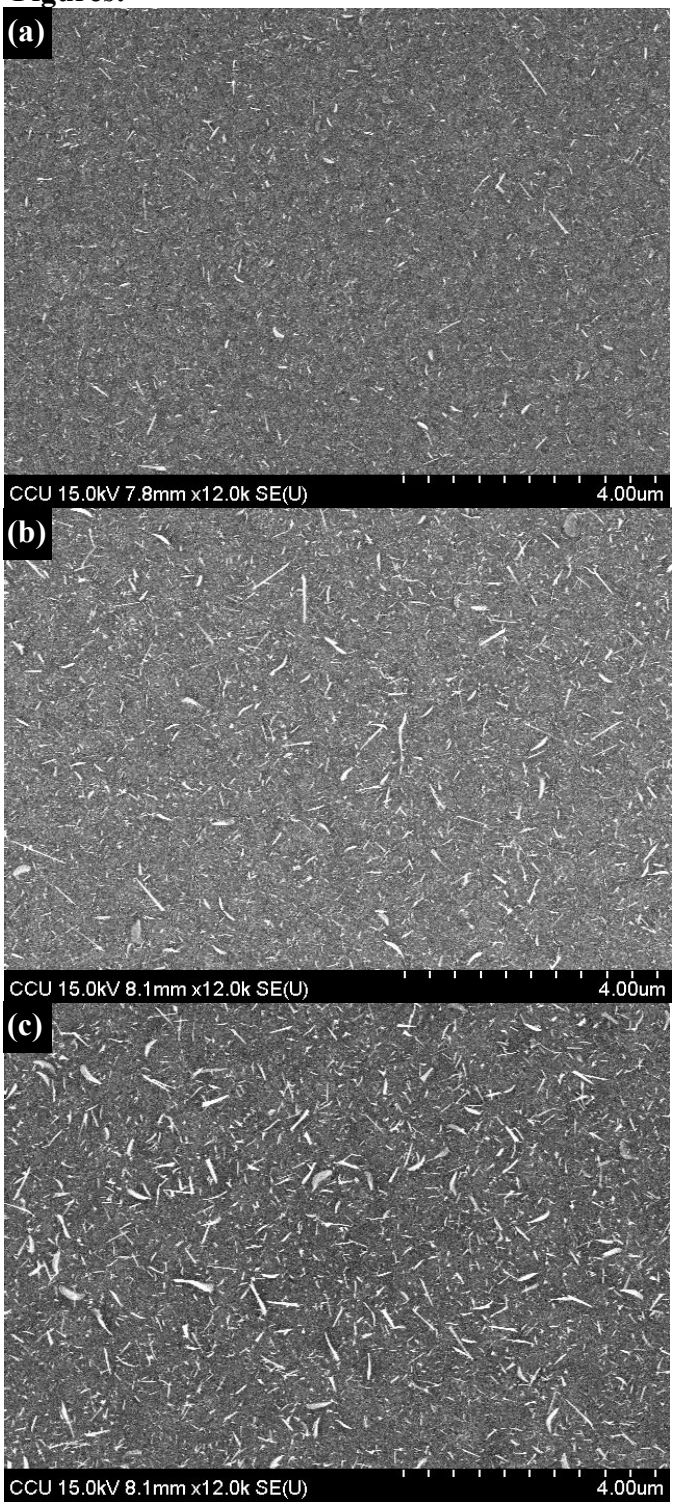

Fig. 1. FE-SEM of α-Fe_2O_3 nanowires growth on (a) 50nm, (b) 100nm and (c) 150nm of the iron films..