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## Fabrication and Characterization of Al/Ni and Al/Ti Multilayer Nanofilms

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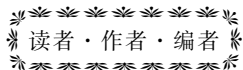
**Abstract:** Al/Ni and Al/Ti multilayer nanofilms were prepared by magnetron sputtering method. Field emission scanning electron microscope (FESEM), atomic force microscopy (AFM) and X-ray diffraction (XRD) were used to characterize the deposited films and analyze the components. The heat released in the alloying reaction was measured by differential scanning calorimetry (DSC). The results show that the samples obtained at 0.4 Pa with sputtering power of 200 W for Al, 220 W for Ni and 180 W for Ti, are uniform and its layered structures are clearly visible. The deposited Al/Ni multilayer nanofilms consist of aluminium and nickel. The Al/Ti multilayer nanofilms consist of aluminium and titanium. The heat released in Al/Ni and Al/Ti multilayer nanofilms is 1134.64, 918.36 J · g<sup>-1</sup>, which reach to 82.2%, 80.7% of theoretical values, respectively.

**Key words:** military chemistry and pyrotechnic technology; Al/Ni multilayer nanofilms; Al/Ti multilayer nanofilms; magnetron sputtering; characterization; thermal analysis

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