Supplementary Information

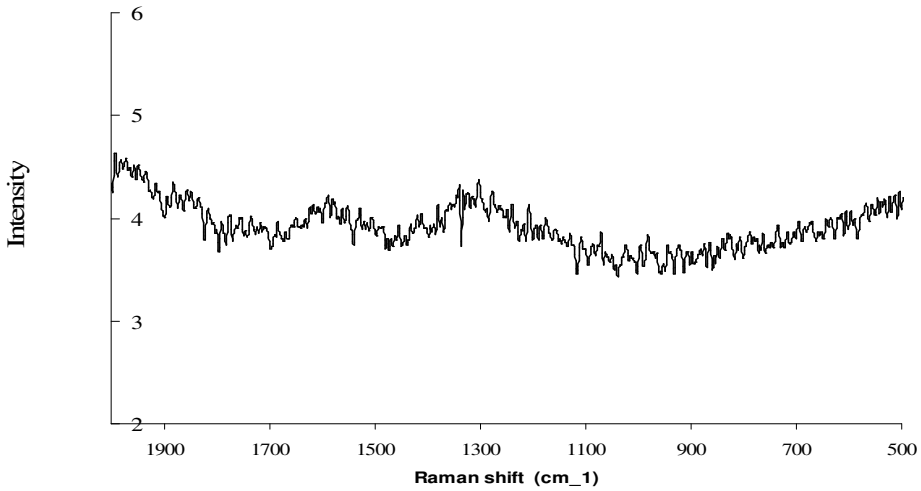

Fig S1. Raman spectrum of the Ta_3N_5 synthesised under high pressure in autoclave showing the signature peaks of graphitic carbon at 1570 and 1325 cm^{-1}

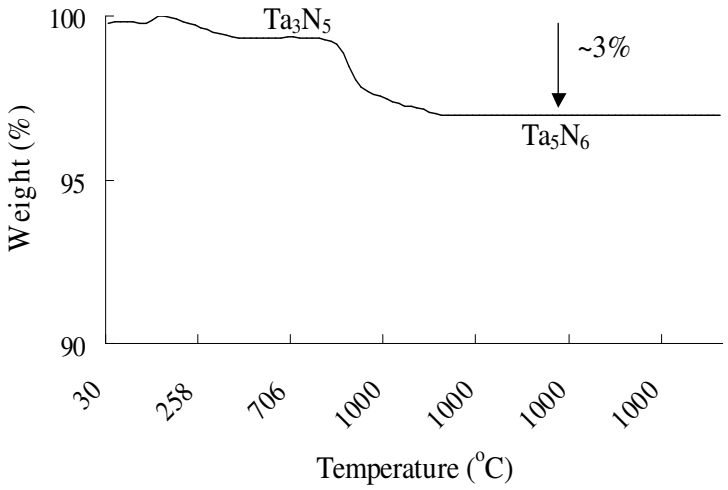

Fig S2. TGA trace showing the decomposition of Ta_3N_5 to Ta_5N_6 under nitrogen - the product is Ta_5N_6 by PXD

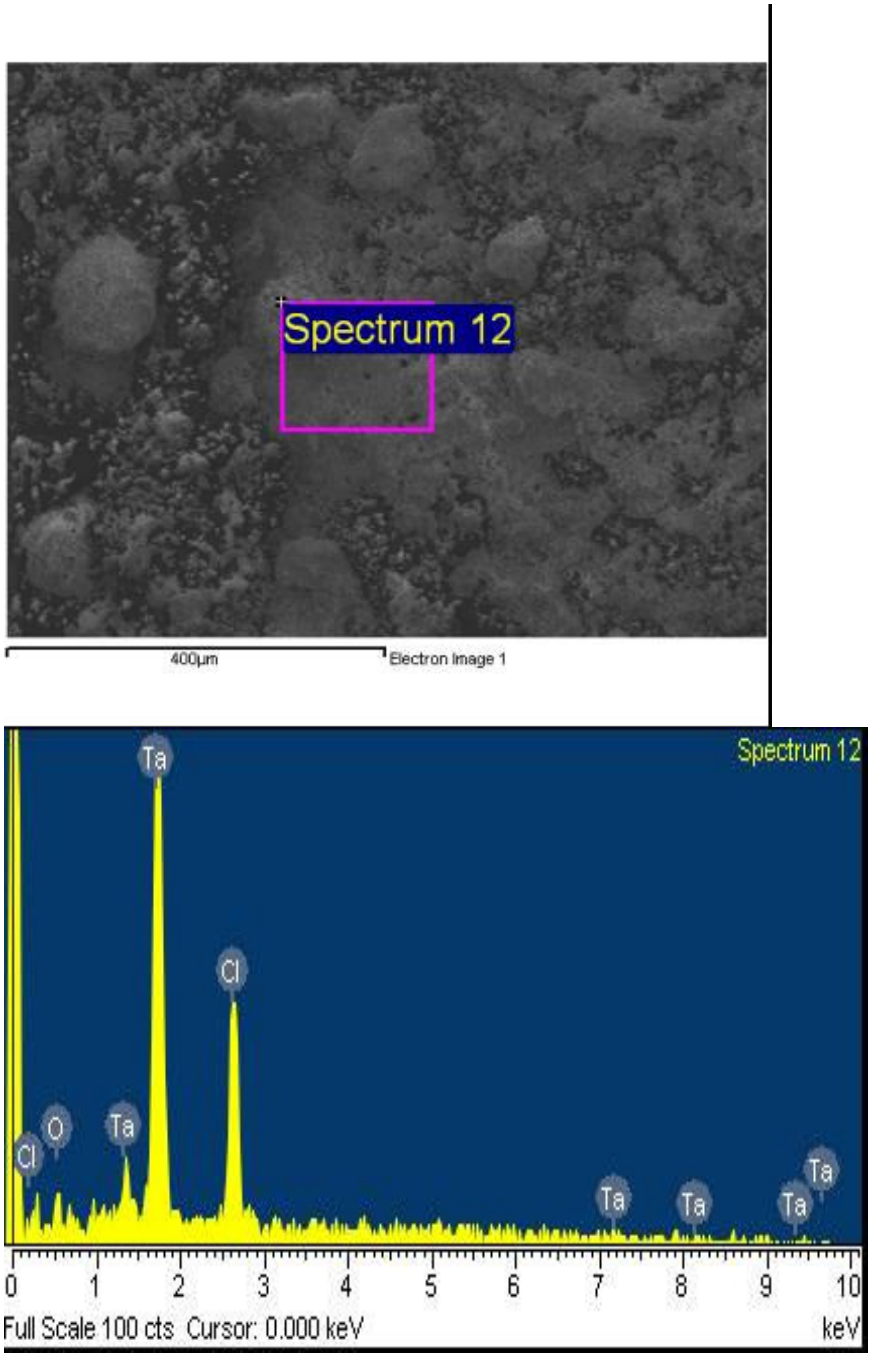

Fig S3. SEM micrograph of the product of reaction of $TaCl_5$ with commercial $LiNH_2$ under ambient pressure before washing with THF. Li is not detectable in the EDX.

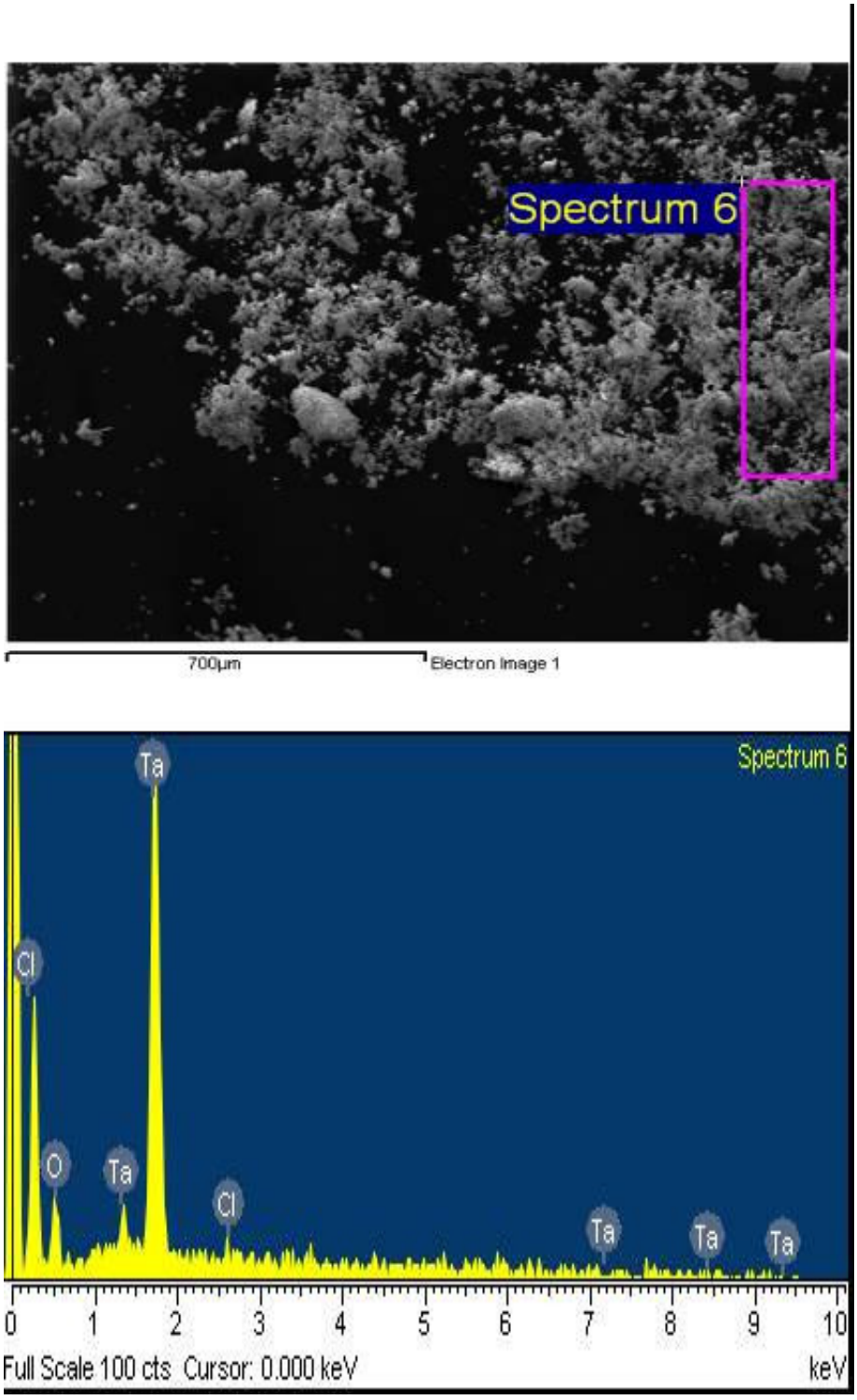

Fig S4. SEM micrograph of the product of reaction of $TaCl_5$ with commercial $LiNH_2$ under reflux after washing with THF (sample **1**).

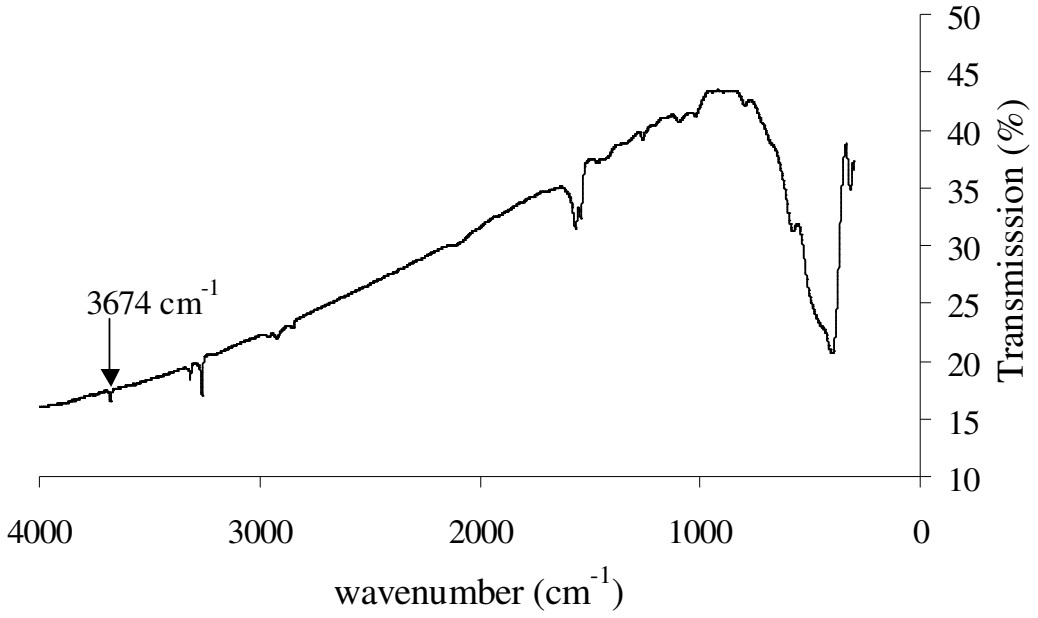

Fig S5. Infrared spectrum of commercial $LiNH_2$ highlighting the peak corresponding to OH stretching.
(J. C. Decius and S. A. Lilley, *J. Chem. Phys*., 1970, **53**, 2124)

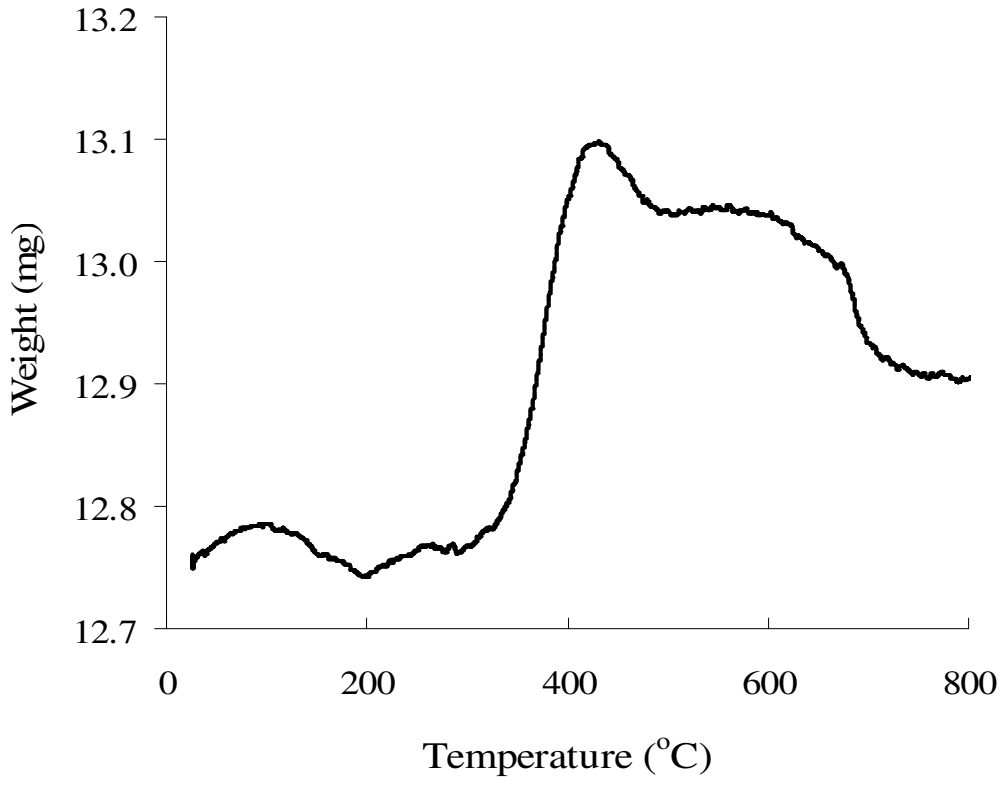

Fig S6. TGA profile for the decomposition of Ta_3N_5 produced by the reaction between $TaCl_5$ and pure $LiNH_2$ under high pressure (sample **3**) in oxygen

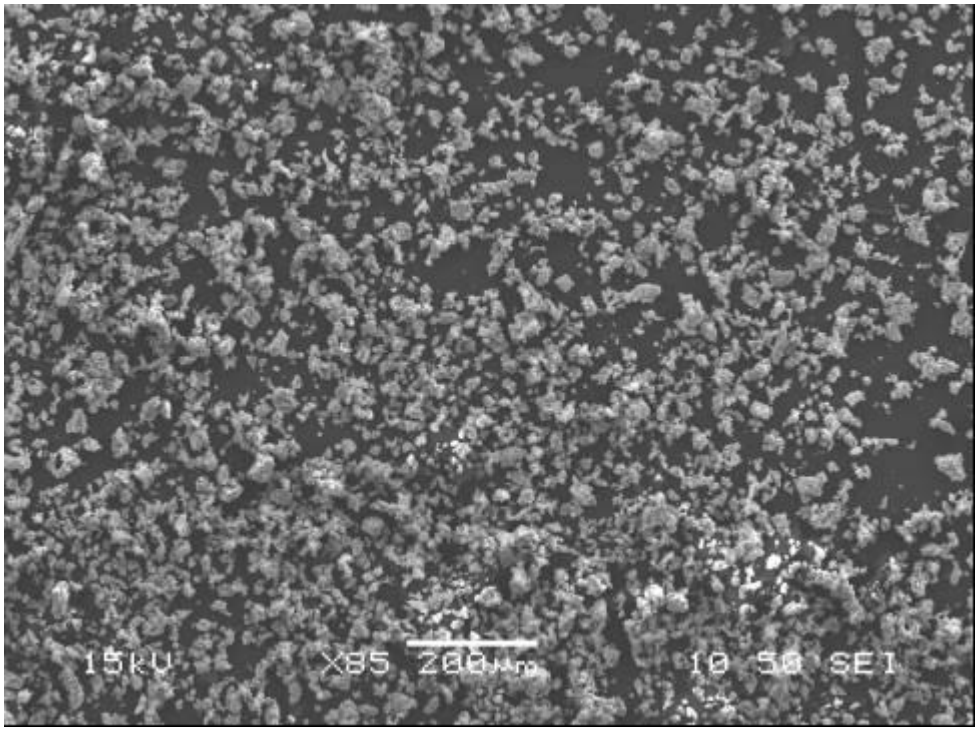

Fig S7. SEM micrograph of the product of the reaction of $TaCl_5$ with Mg_3N_2 under ambient pressure after washing (sample **4**)

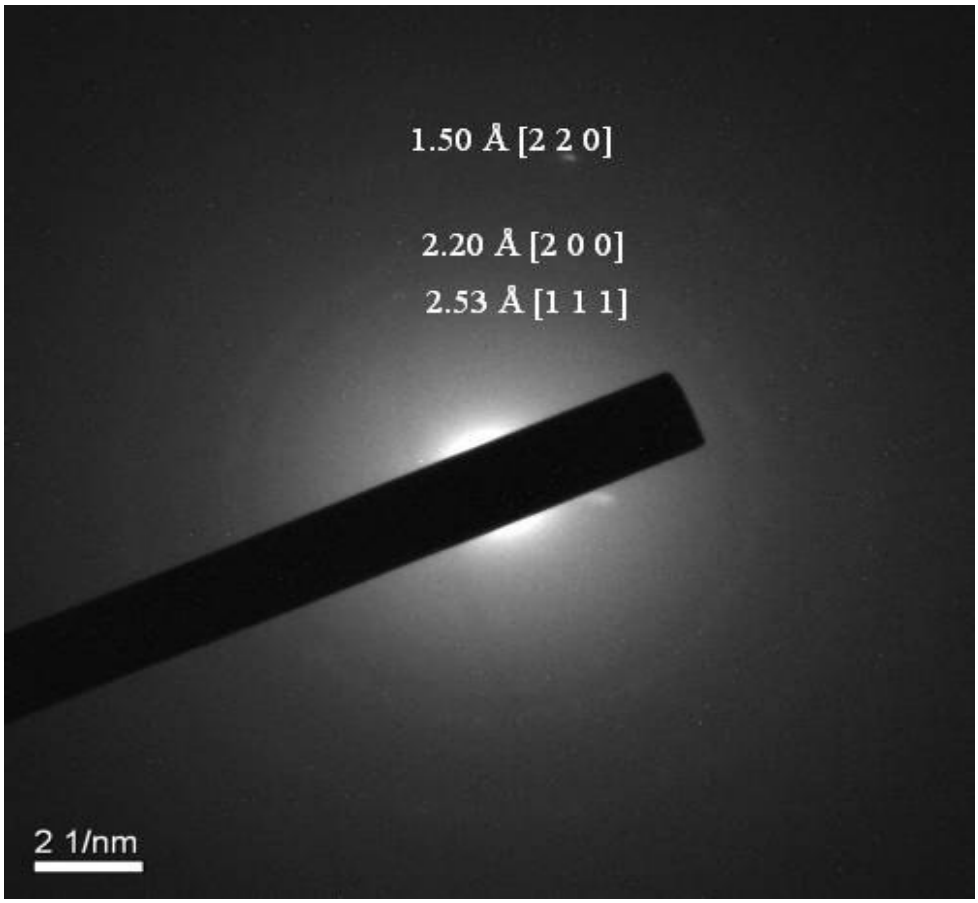

Fig S8. Electron Diffraction Pattern of the product of the reaction of $TaCl_5$ with Mg_3N_2 under ambient pressure after washing (sample **4**)