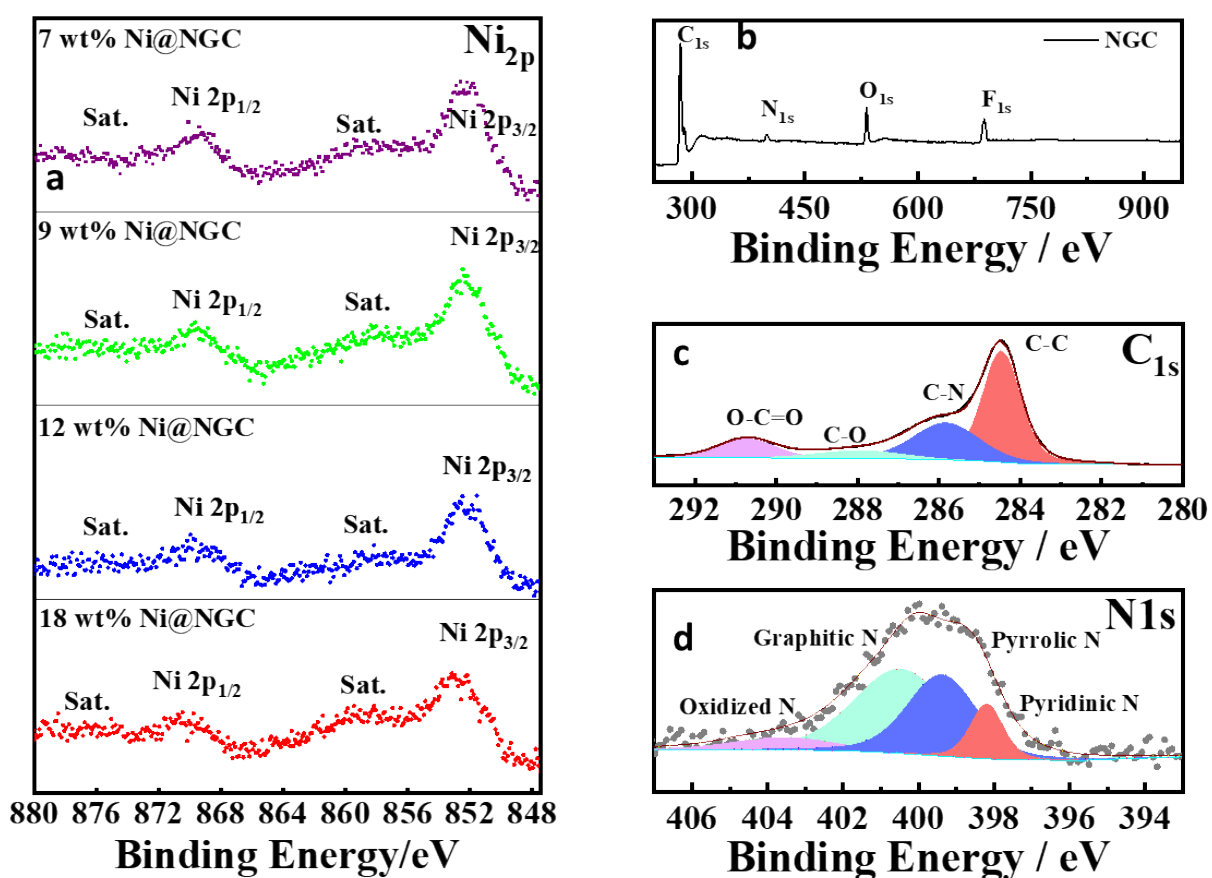


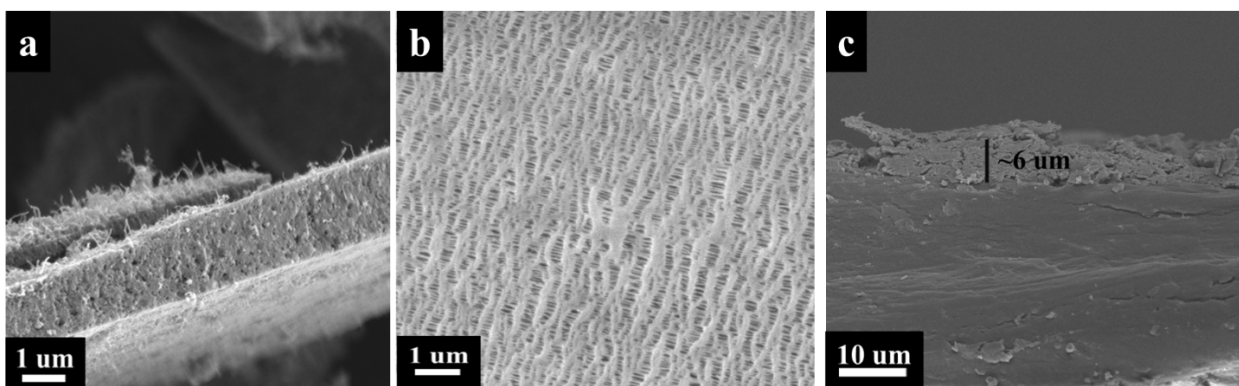
## Supporting Information

**Proposed title:** “Catalytic Effects of different loadings of Ni nanoparticles Encapsulated in Few Layers N-doped Graphene and Supported by N-doped Graphitic Carbon in Li-S batteries”

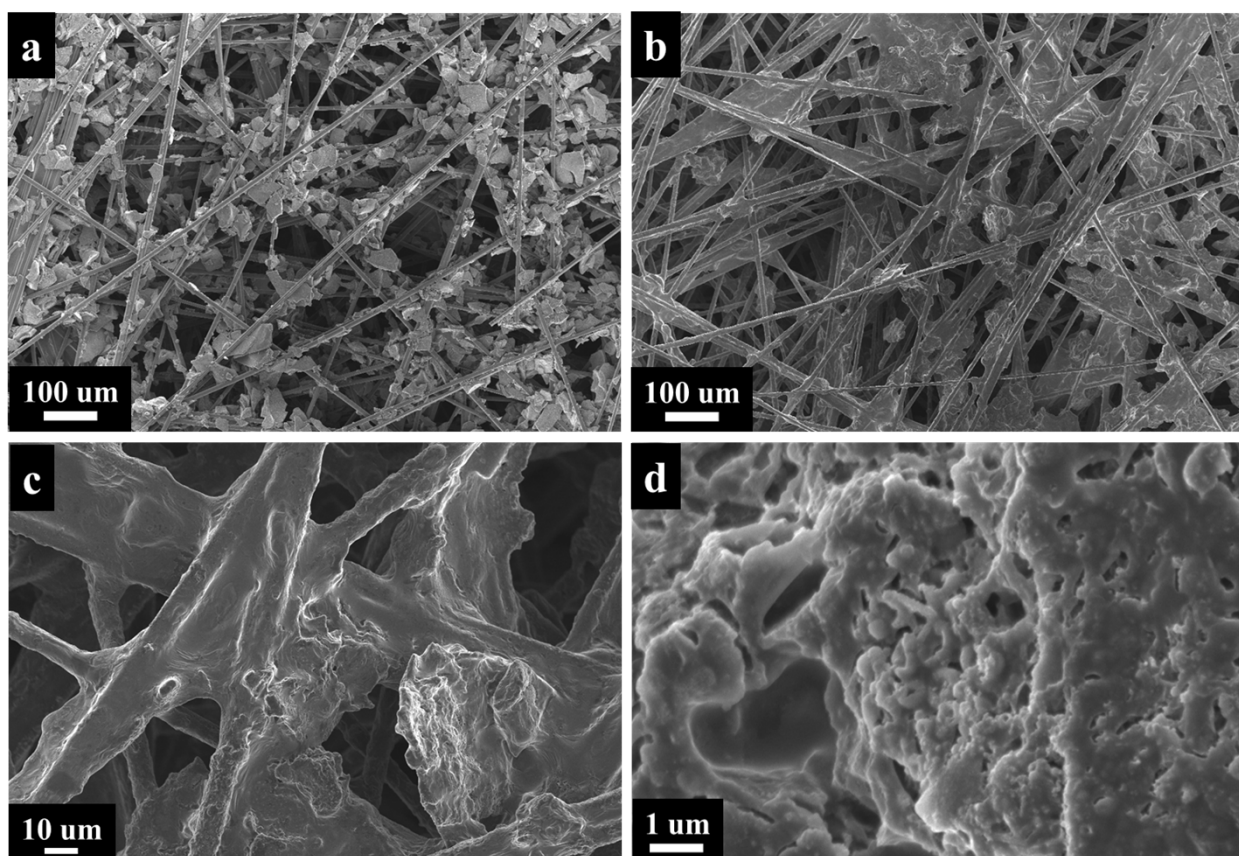
**Authors:** Nurzhan Baikalov, Islam Rakhimbek, Aishuak Konarov, Almagul Mentbayeva, Yongguang Zhang, Zhumabay Bakenov



**Figure S1.** a – Ni 2p core level XPS spectrum of Ni@NGC, b – general survey, c - C<sub>1s</sub> core level XPS spectrum, d – N<sub>1s</sub> core level spectrum of NGC



**Figure S2.** SEM images of **a** –NGC, **b** – bare separator, **c** – cross-section image of Ni@NGC modified separator



**Figure S3.** SEM images of Ni@NGC<sub>9</sub> loaded carbon paper **a** – at low magnification, **b** – Ni@NGC<sub>9</sub> loaded carbon paper after Li<sub>2</sub>S nucleation test, **c**, **d** – at higher magnification