

Figure S1: Schematic of High-pressure magnetic suspension (Rubotherm).

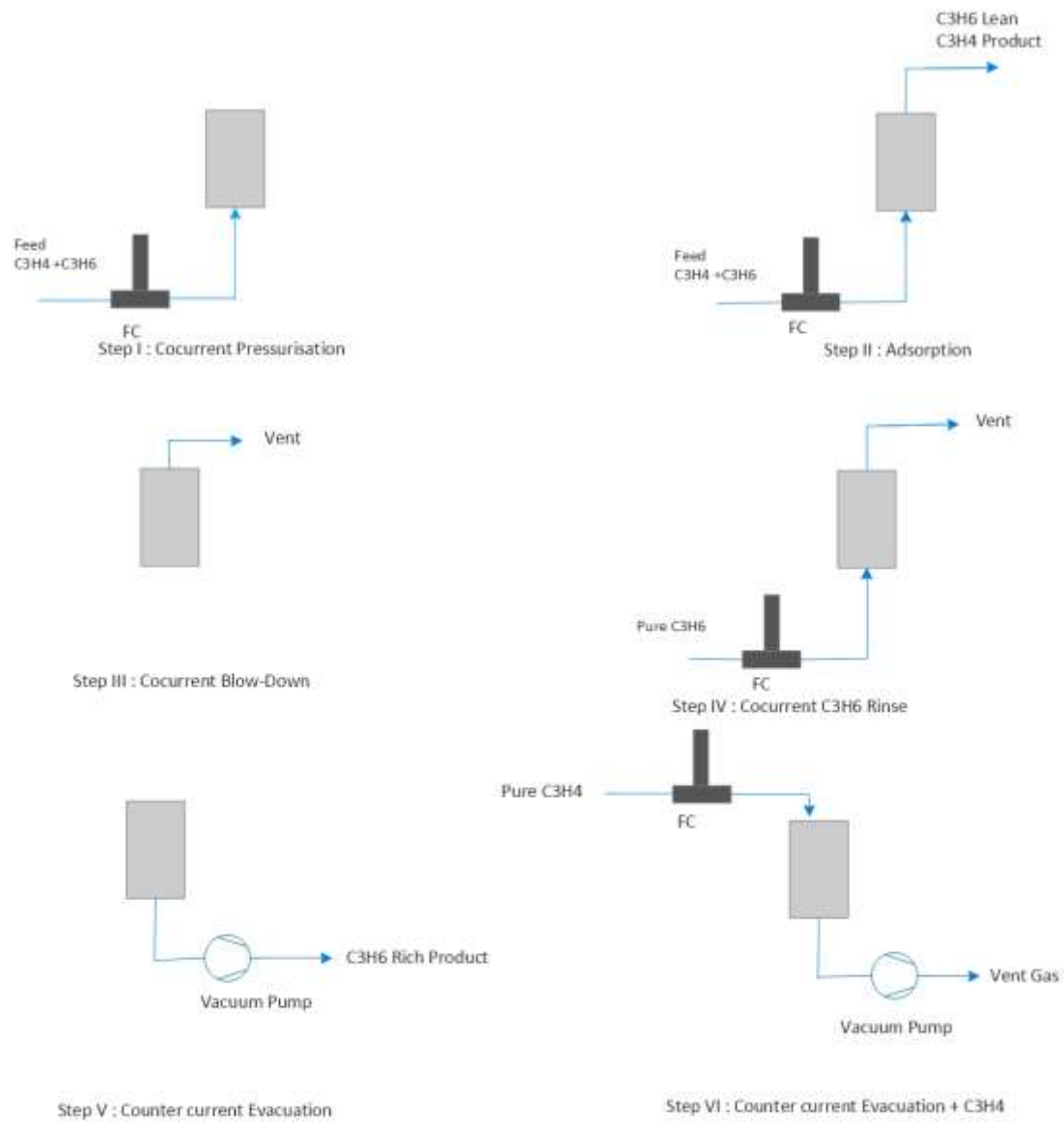


Figure S2: The 6 steps of the VSA cycle.

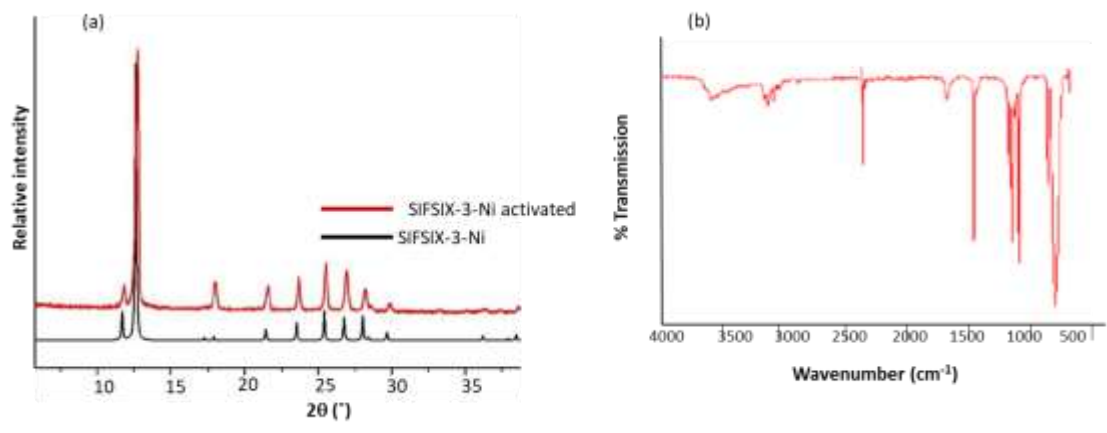


Figure S3: Characterization of the prepared SIFSIX-3-Ni (a) XRD and (b)FTIR.

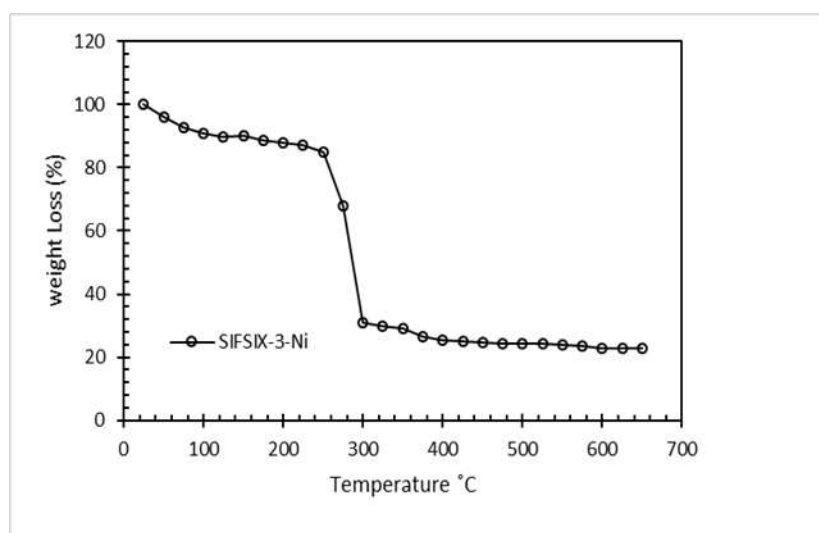


Figure S4: TGA mass loss with respect of temperature for the SIFSIX-3-Ni.

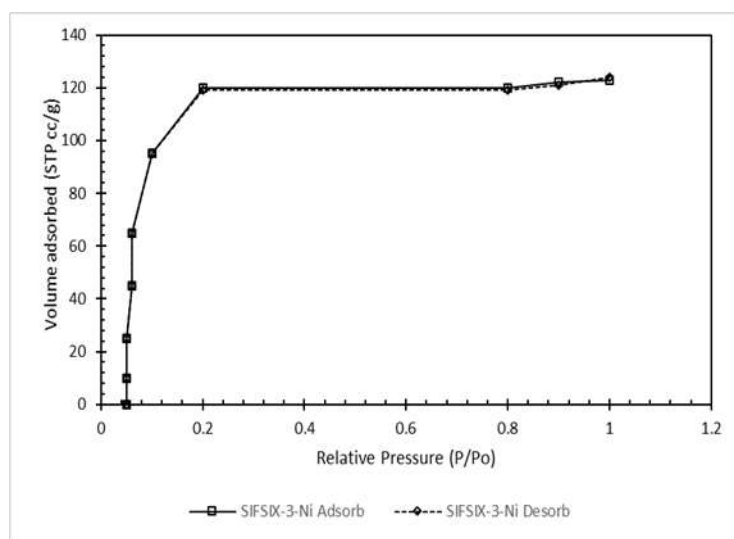


Figure S5:  $\text{N}_2$  adsorption desorption

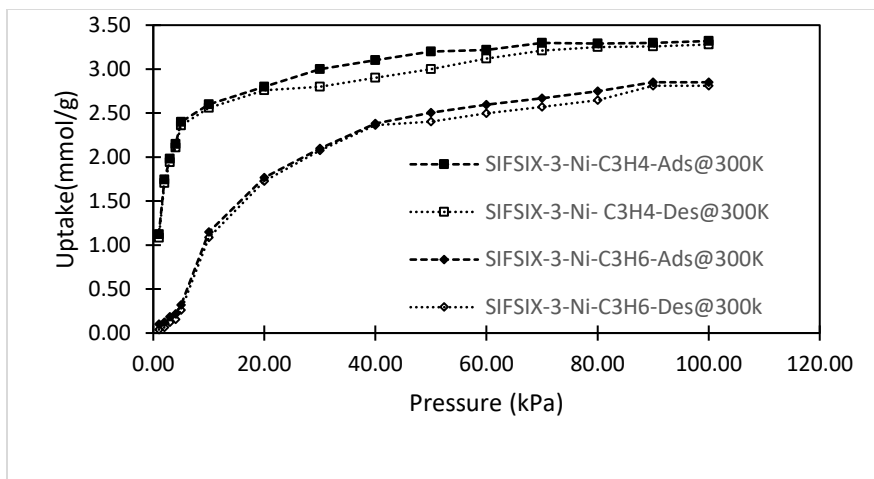


Figure S6: Adsorption and desorption of propylene and propyne at 300k.