

## Supporting Information

### **Green approach for the synthesis of acrylonitrile hyperbranched polymer/chitosan for the uptake of diclofenac from water: Determination of the optimal conditions by the statistical design of experiment.**

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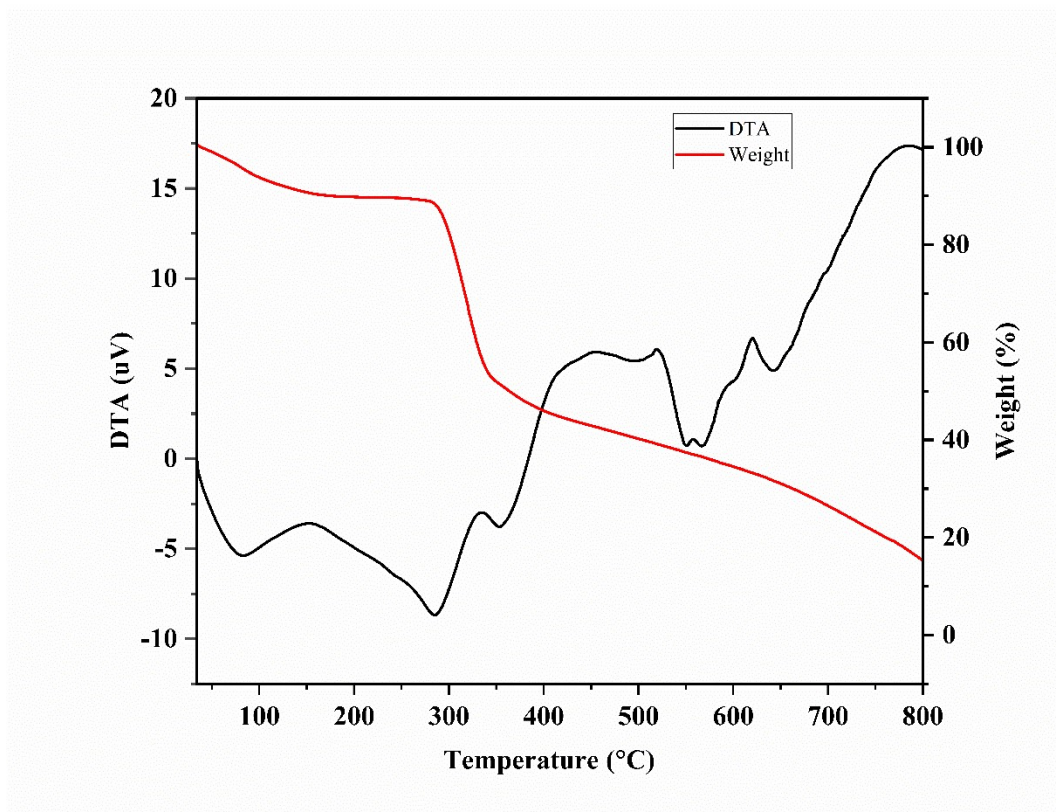
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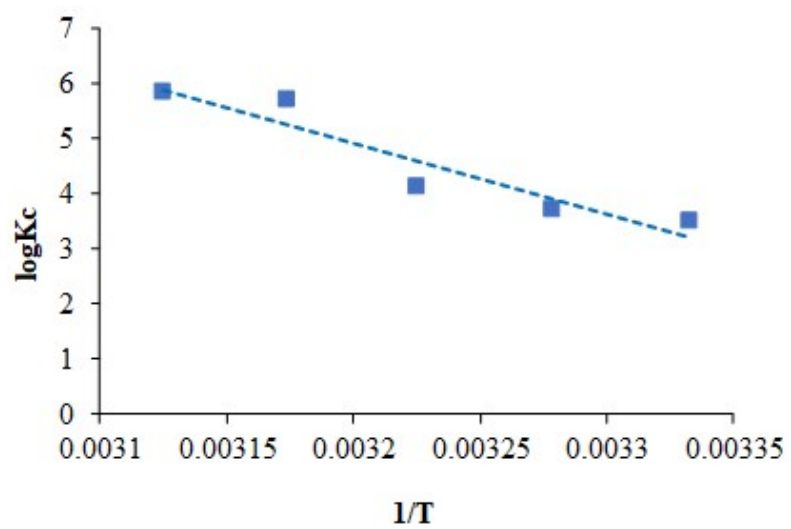
#### **Text**

**S1: Characterization of Material.** Throughout the extensive experimental investigations, we employed a series of analytical techniques to characterize the material. The pH meter (Cyberscan pH 2100) was used to monitor the solution pH, while UV-VIS spectrophotometer (UV-1800, Shimadzu, Japan) utilized to measure the amount of diclofenac in the solution. Perkin Elmer Spectrum 2 FT-IR spectrometer (4000-400  $\text{cm}^{-1}$ ) were used to acquire the Fourier transform infrared (FT-IR) spectra. SEM integrated with EDX (JEOL JSM-6510LV, Japan) were utilized to thoroughly examine the morphological change and elemental composition of material. Additionally, the surface area and porosity characteristics of material determined by using a surface pore analyzer (Micromeritics ASAP 2020 BET) with  $\text{N}_2$  gas adsorption/desorption at 77 K. The crystallinity of material was judged by PXRD utilizing high-performance X-ray powder diffractometer (Bruker AXS D8 Advance, Germany) equipped with  $\text{Cu K}\alpha$  radiation ( $\lambda = 0.154$  Å). The elemental composition and chemical state were evaluated by X-ray photoelectron

spectroscopy (XPS) analysis utilizing Thermo Scientific K-Alpha XPS system. Thermal properties of material were examined by TGA-DTA by using DTG 60H thermal analyzer (Shimadzu, Japan). The particle size distribution of the Ac-Hyp/Cs was investigated by Dynamic Light Scattering (DLS) technique utilizing Horiba SZ-100 equipment.



**Figure S1.** TGA and DTA curves of AC-Hyp/CS composite.



**Figure S2.** Von't Hoff plot for adsorption of diclofenac onto AC-Hyp/CS.