Supplementary Materials

Exploring the Adsorptive Properties of an Embryonic Zeolite toward Methylene Blue

Rusi Rusew[a,b*], Hristina Lazarova[a,b], Magdalena Angelova[a,b], Nevena Petkova-Yankova[a], Rositca Nikolova[a] and Valentin Valtchev[a,c*]

[a.] University of Sofia, Faculty of Chemistry and Pharmacy, 1126 Sofia, Bulgaria.
[b.] Institute of Mineralogy and Crystallography Acad. I. Kostov, Bulgarian Academy of Sciences, Acad. G. Bonchev Str., bl. 107, 1113 Sofia, Bulgaria
[c.] Normandie Univ, ENSICAEN, UNICAEN, CNRS, Laboratoire Catalyse et Spectrochimie, 6 Marechal Juin, 14050 Caen, France

Table of Figures

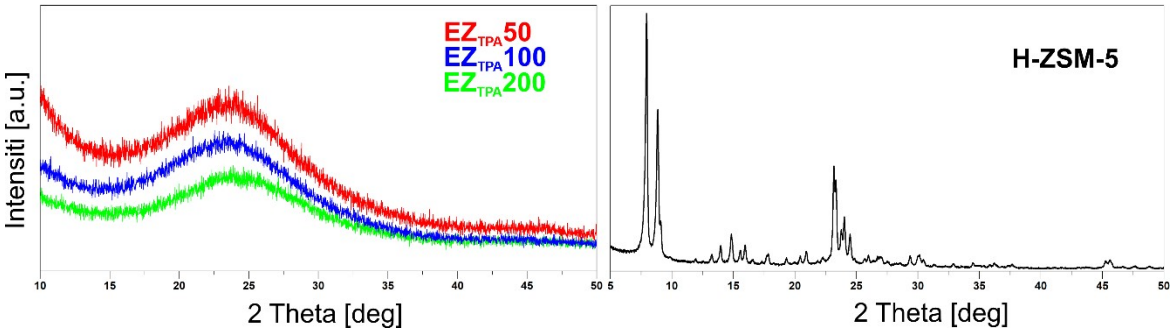

Figure S 1. PXRD of embryonic zeolite precursors obtained with Si/Al ratio of the starting mixture = 200, 100, 50 (left) and fully crystalline ZSM-5 obtained from Si/Al = 200 (right).

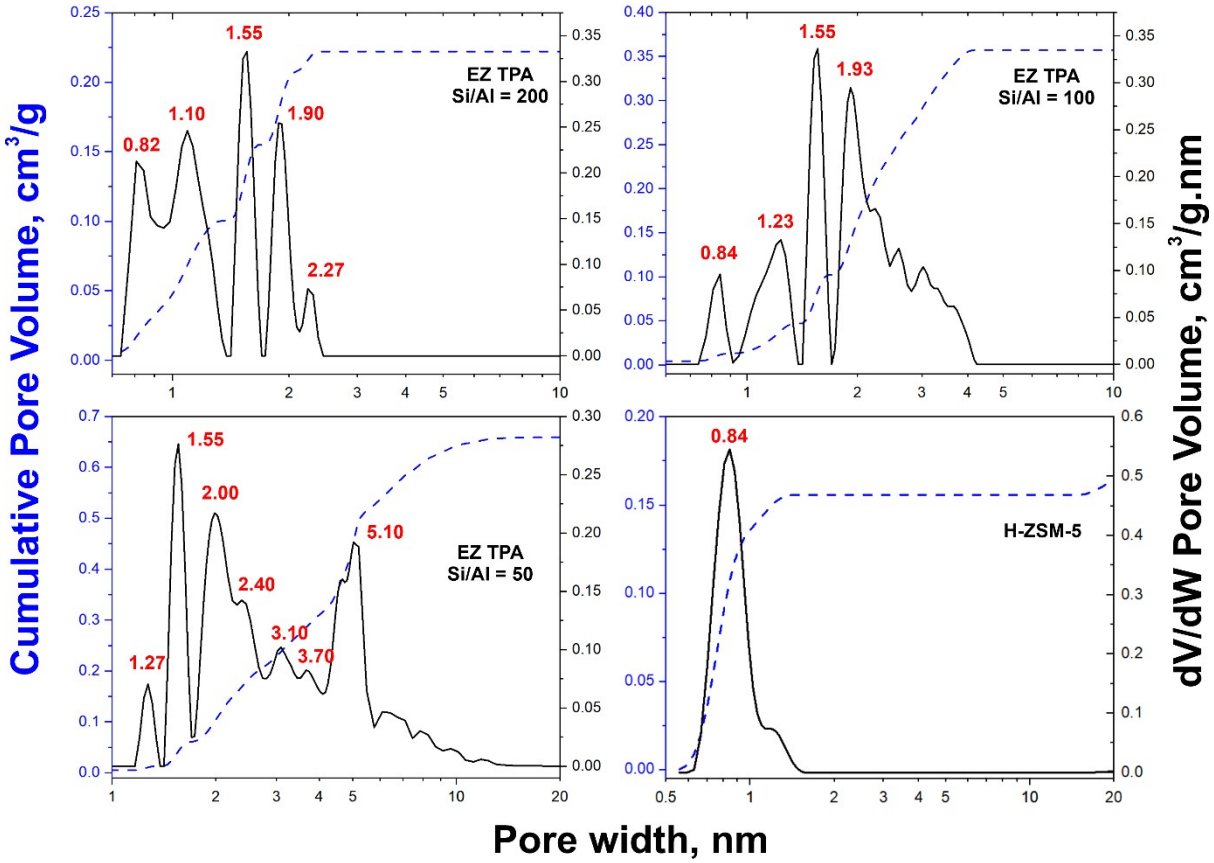

Figure S 2. The DFT pore size distribution and cumulative pore volume plots of embryonic zeolite (EZ) samples synthesized with TPA-OH and Si/Al ratio of the starting mixture = 50, 100, 200 and H-ZSM-5.

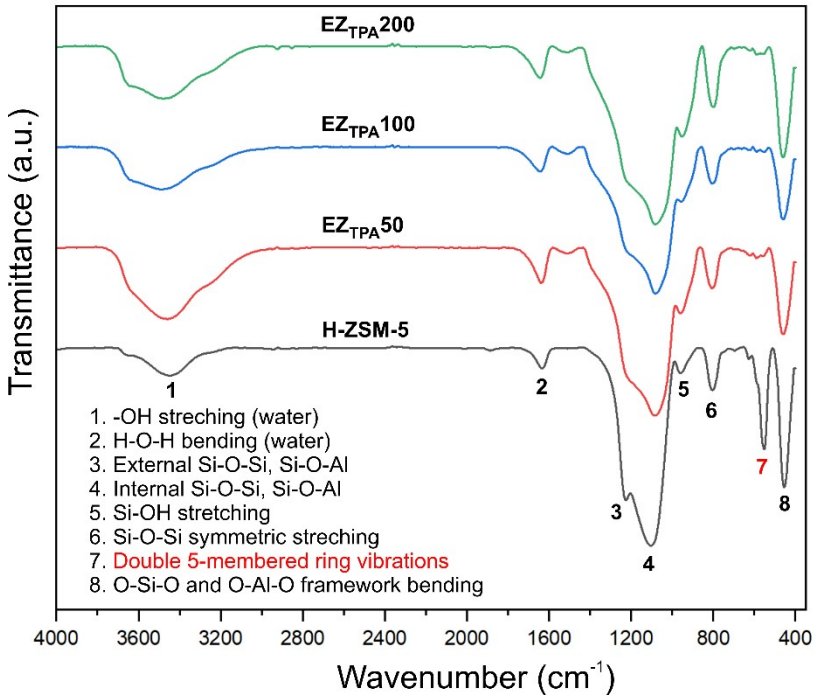

Figure S 3. FTIR spectra of H-ZSM-5 and $EZ_{TPA}200$, $EZ_{TPA}100$, $EZ_{TPA}50$ reveal key vibrational bands characteristic of silicate frameworks. The absence of the MFI fingerprint band at ~550 cm^{-1} in EZ_{TPA} materials confirms their amorphous, pre-crystalline nature.

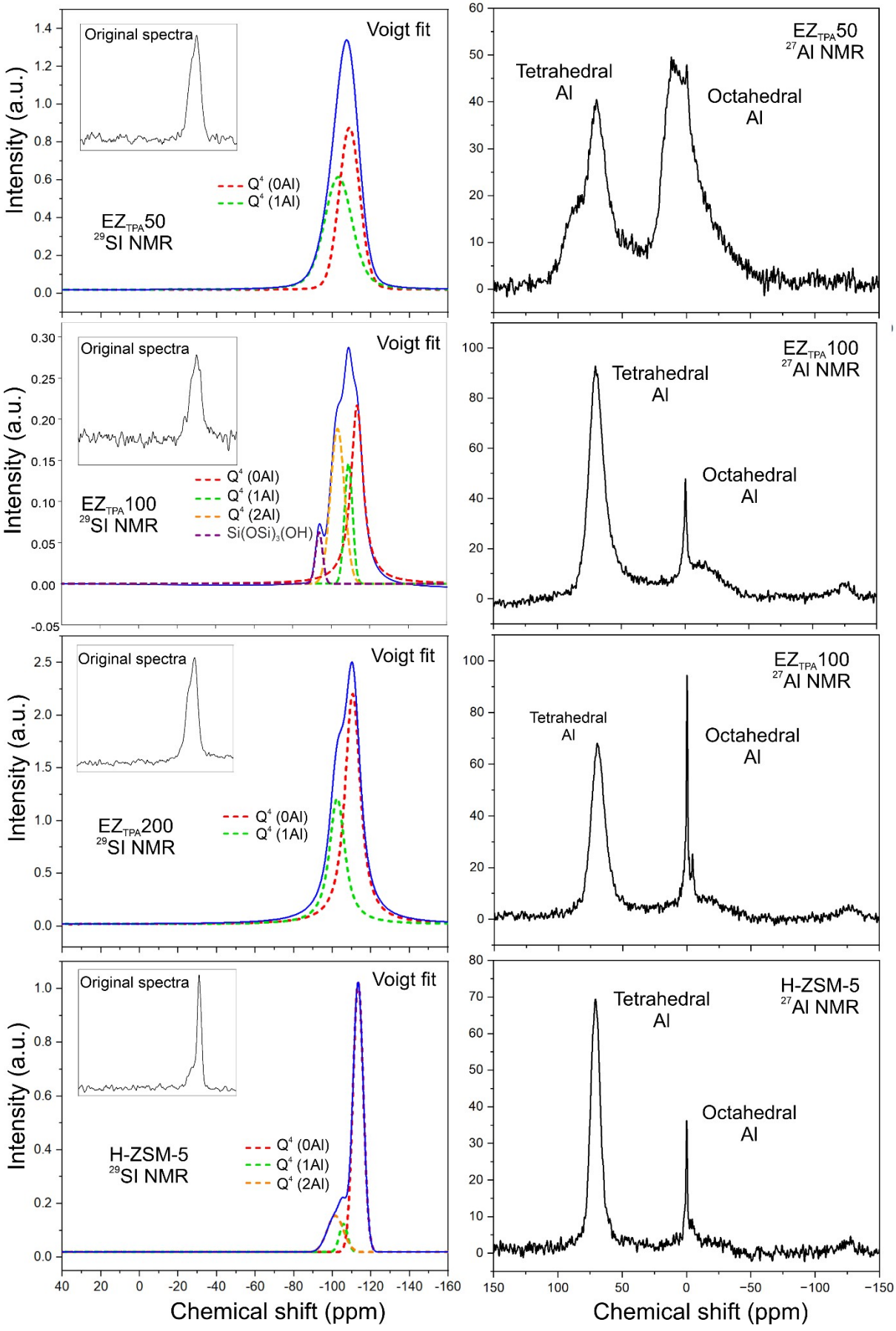

Figure S 4. ^{29}Si and ^{27}Al NMR spectra of $EZ_{TPA}50$, $EZ_{TPA}100$, $EZ_{TPA}200$ and H-ZSM-5.

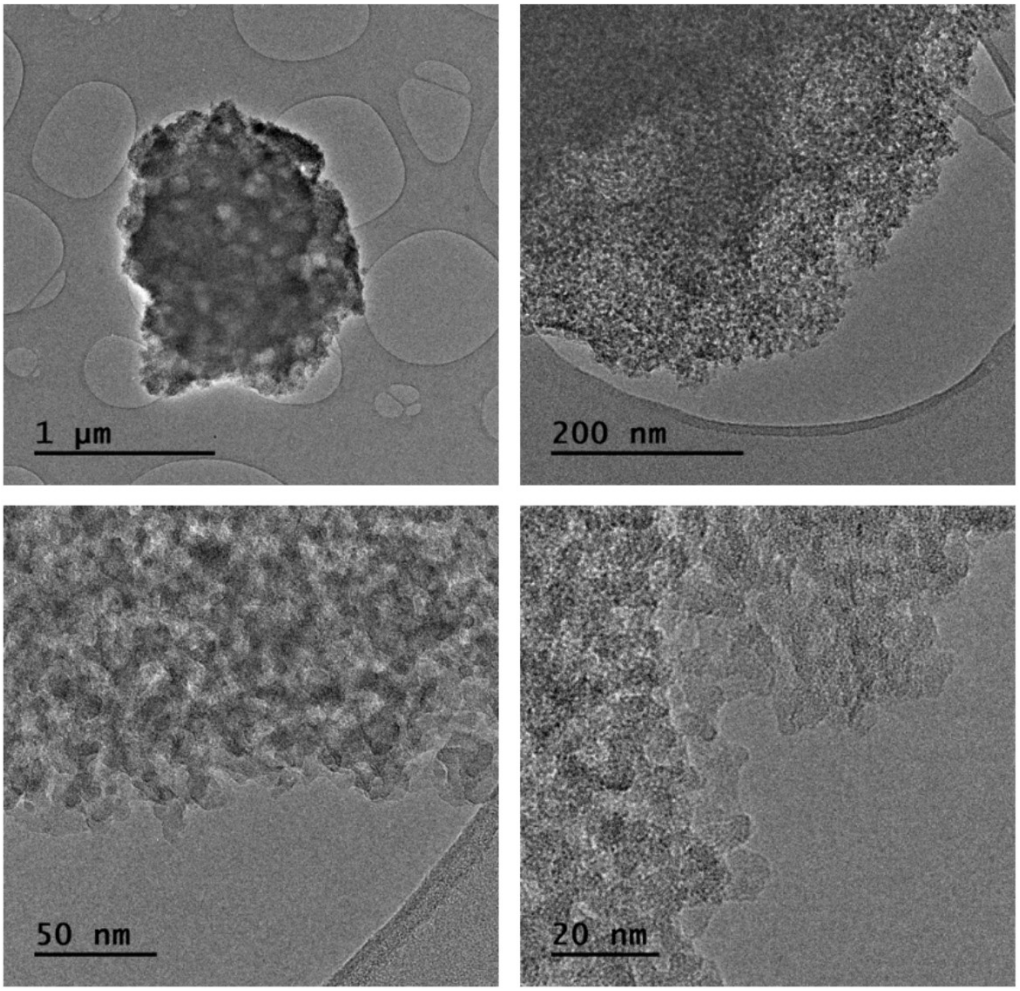

Figure S 5. Different magnification transmission electronic micrographs of $EZ_{TPA}50$ sample.

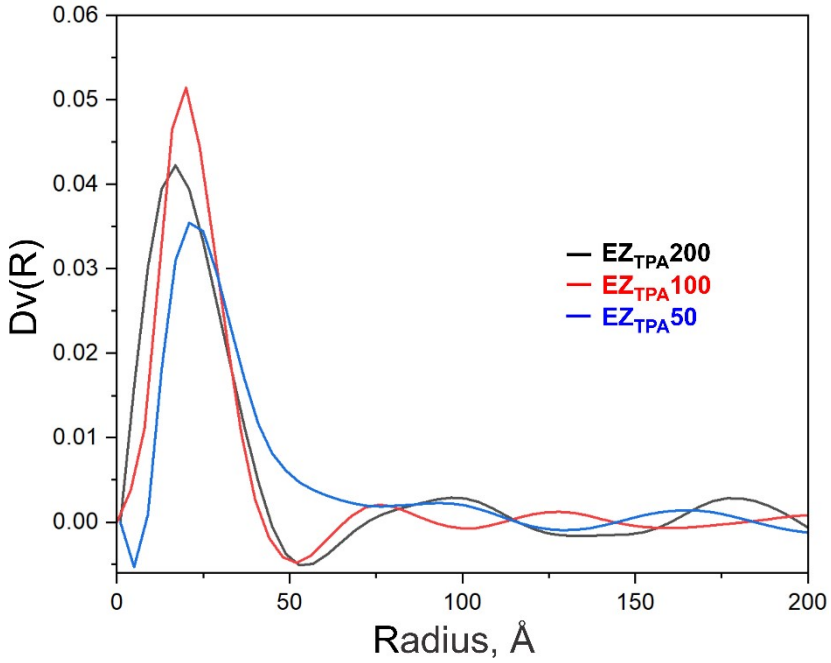

Figure S 6 Particle size distribution of EZ with Si/Al = 50, 100 and 200 derived from SAXS experiment. The distributions represent the volume-weighted particle radius (Dv(R)) profiles.

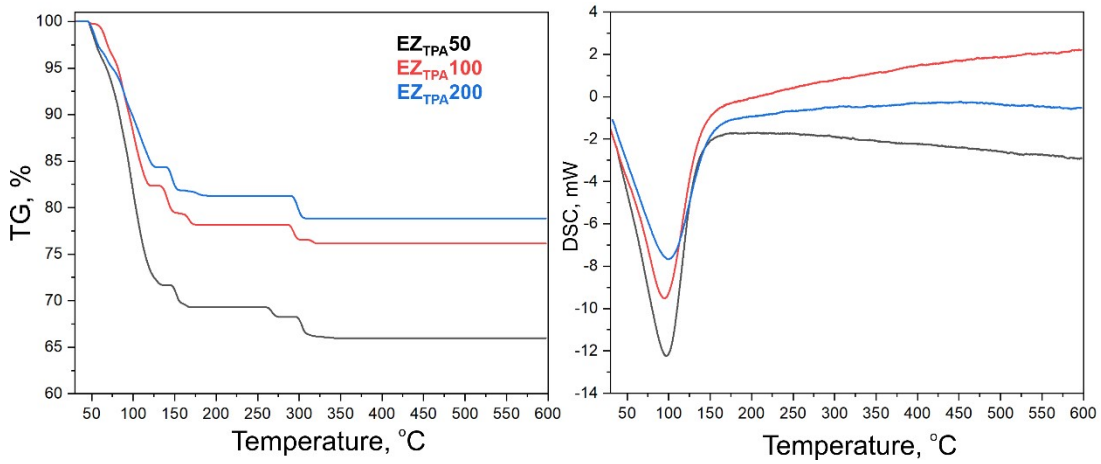

Figure S 7 TGA and DSC graphs of embryonic zeolite precursors, showing the water release related weight losses or thermal effects.

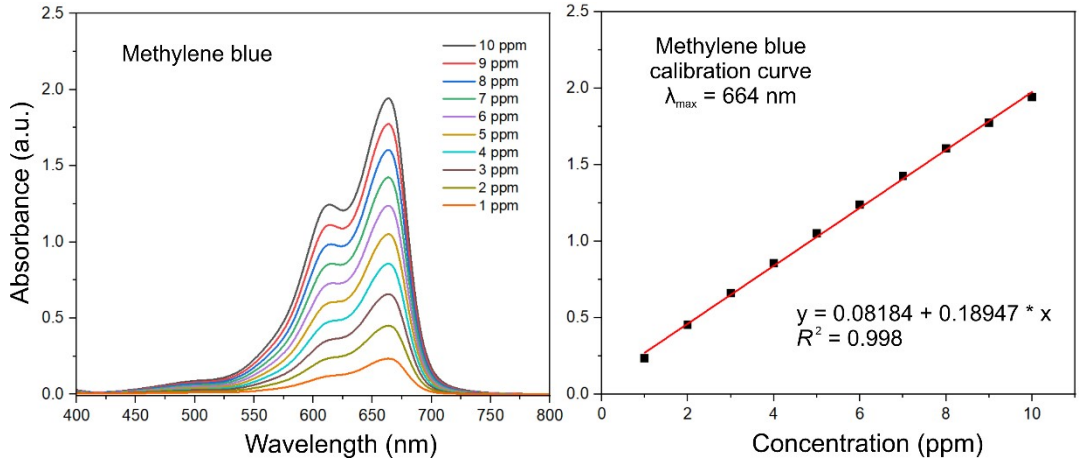

Figure S 8 Methylene blue calibration curve in the 1 – 10 ppm region (λ_{max} = 664 nm).

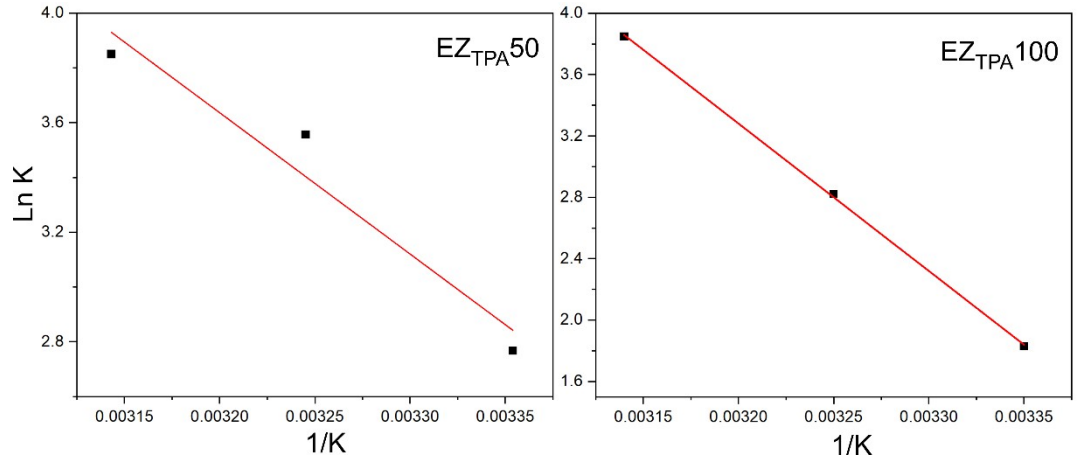

Figure S 9 Van't Hoff plots (*lnK* vs 1/T) of $EZ_{TPA}50$ and $EZ_{TPA}100$ obtained at 25, 35 and 45 °C.