Supplementary information

Table 1. Thermodynamic parameters obtained from the Dubinin-Astakhov fittings of the propene and trans-2 butene adsorption isotherms in ITQ-32 zeolite at different temperatures.

	T **(K)**	Q_∞ **(mol/g)**	***m***	***E*** **(KJ/mol)**
propene	298	1.24×10^{-3}	3.5	18.8
	333	1.22×10^{-3}	3.5	19.6
	363	1.21×10^{-3}	4.1	19.2
trans-2-butene	298	1.18×10^{-3}	2.7	15.2
	333	1.17×10^{-3}	1.9	18.6
	363	1.07×10^{-3}	2.1	18.5

The Dubinin-Askatakov equation is as follows:

$$Q = Q_\infty \cdot \exp\left[-\left(\frac{RT}{E}\right)^m \cdot Ln^m\left(\frac{P_0}{P}\right)\right]$$

where E is the characteristic free energy of adsorption, m is a integer related to the Weibull distribution of pore size, R is the universal gas constant, T is the temperature, P is the pressure and P_0 is the estimated saturation pressure of the corresponding gas at a given temperature assuming the Antoine equation and using the coefficients given by R. C. Reid, J. M. Prausnitz, B. E. Poling in *'The Properties of Gases and Liquids'* (Ed. McGraw-Hill; 4th edition), 1987.

Table 2. Ratio of the diffusion parameters (R_D) of propene and propane in ITQ-32 and Chabazite at 30.4 KPa and different temperatures, calculated using equation (1).

	R_D	
	298 K	**333 K**
ITQ-32	1430	1611
Chabazite	5268	2265

Table 3. D/r^2 parameters for trans-2-butene and 1-butene adsorption in chabazite and ITQ-32 at 30.4 KPa and different temperatures, calculated using equation (1).

	D/r^2 (s^{-1}) [(a)]			
	Chabazite		**ITQ-32**	
	298 K	**333 K**	**298 K**	**333 K**
trans-2-butene	3.19×10^{-5}	1.19×10^{-4}	4.73×10^{-5}	2.46×10^{-4}
1-butene	3.38×10^{-8}	3.67×10^{-7}	9.71×10^{-8}	1.10×10^{-6}

[a] Fitting of equation (1) was done assuming that Q_∞ of C_4 was the same than that of trans-2-butene.

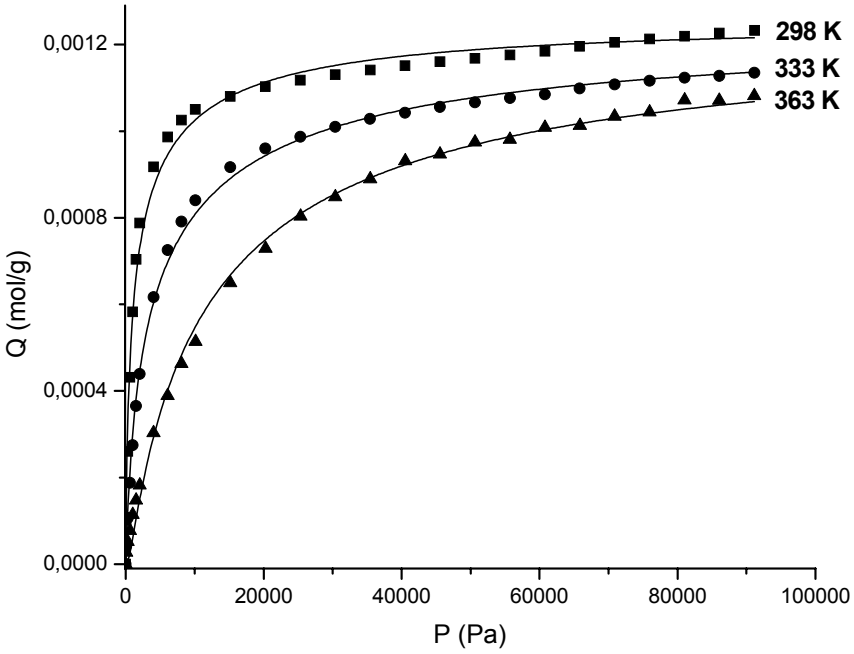

Figure 1. Adsorption isotherms of propene in ITQ-32 zeolite at different temperatures using the equilibrium conditions described in the main text. The lines correspond to the Dubinin fittings using equation given in Table 1 of Supplementary Information.

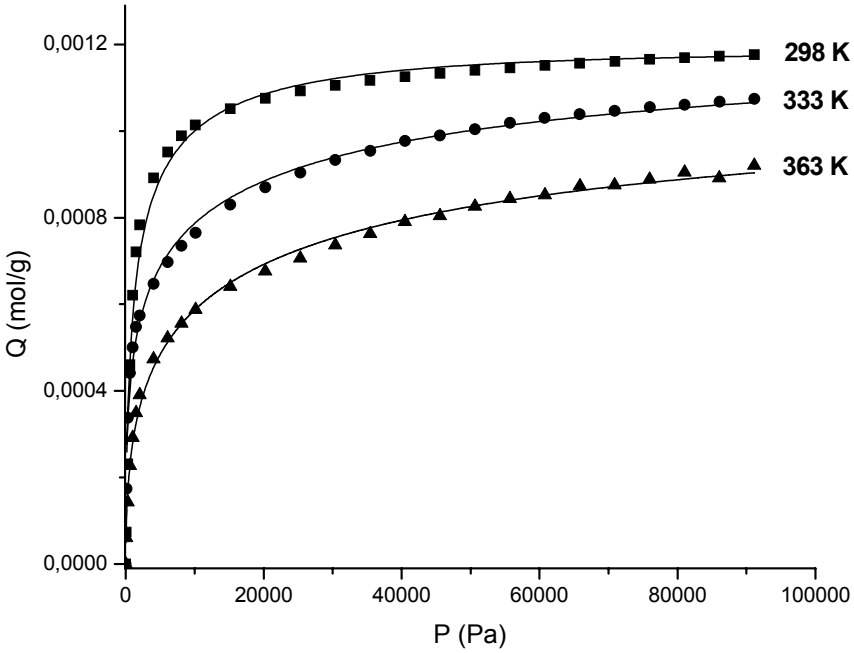

Figure 2. Adsorption isotherms of trans-2-butene in ITQ-32 zeolite at different temperatures using the equilibrium conditions described in the main text. The lines correspond to the Dubinin fittings using equation given in Table 1 of Supplementary Information.

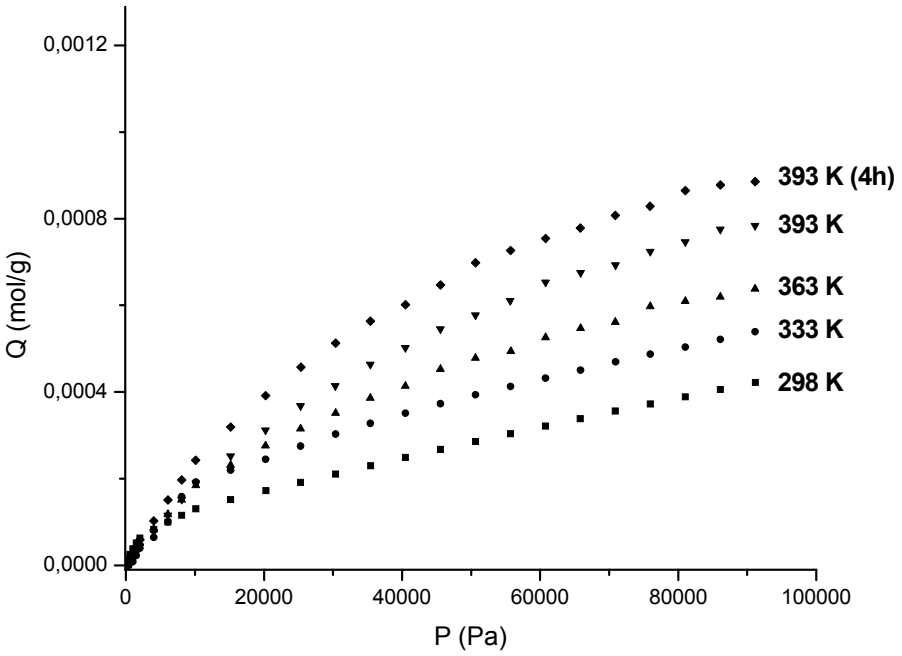

Figure 3. Adsorption isotherms of propane in ITQ-32 zeolite at different temperatures using the equilibrium conditions described in the main text, except for isotherm at 393 K (4h), that were conducted during four hours. None of the isotherm given in this figure reached equilibrium.

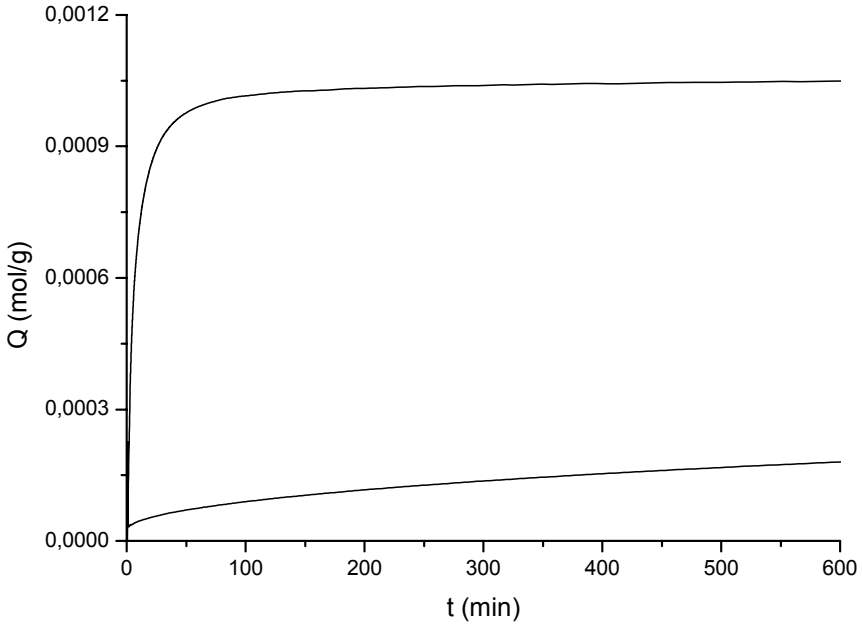

Figure 4. Adsorption kinetics of propene (top) and propane (bottom) in ITQ-32 zeolite at 333 K and 30.4 KPa.

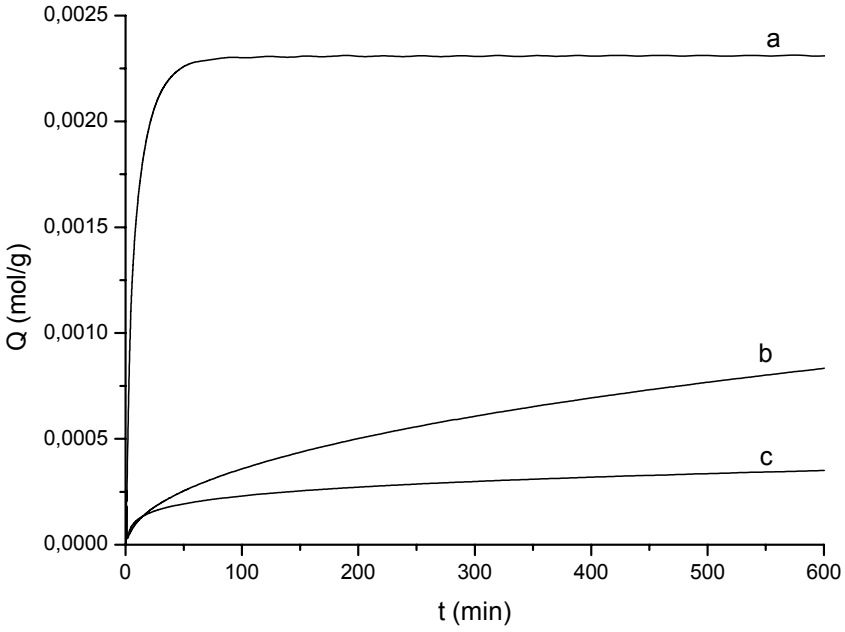

Figure 5. Adsorption kinetics of trans-2 butene (a), 1-butene (b) and cis-2-butene (c) in Chabazite at 333 K and 30.4 KPa.