Electronic Supplementary Information

Adsorption of diclofenac on a magnetic adsorbent based on maghemite: experimental and theoretical studies

V. L. Oliveira,[a] M. C. Pereira,[b] S. F. Aquino,[a] L. C. A. Oliveira,[c] S. Correa,[d] T. C. Ramalho,[d] L. V. A. Gurgel,[a] and A. C. Silva[a*]

[a]*Departamento de Química, Universidade Federal de Ouro Preto, Ouro Preto 35400-000, Minas Gerais, Brazil*

[b]*Instituto de Ciência, Engenharia e Tecnologia, Universidade Federal dos Vales Jequitinhonha e Mucuri, Teófilo Otoni 39803-371, Minas Gerais, Brazil*

[c]*Departamento de Química, Universidade Federal de Minas Gerais, Belo Horizonte 31270-090, Minas Gerais, Brasil*

[d]*Departamento de Química, Universidade Federal de Lavras, Lavras 37200-000, Minas Gerais, Brazil*

***Corresponding author.** adilsonufla@gmail.com; adilsonqui@iceb.ufop.br

Table S1. Isotherm parameters estimated for diclofenac adsorption on maghemite at pH 7.0 and different temperatures.

Temperature (K)	283	288	298	308	318
$Q_{max.exp}$ (mg g^{-1})	199.68	234.36	257.10	249.85	244.40
μ (mol L^{-1})	2.21×10^{-4}	1.66×10^{-4}	1.34×10^{-4}	1.08×10^{-4}	4.42×10^{-5}
γ_e	0.983	0.985	0.987	0.988	0.992
Langmuir					
$Q_{max.est}$ (mg g^{-1})	228.06	244.16	260.74	254.08	251.52
b (L mg^{-1})	0.050	0.183	0.700	1.100	1.312
b (L mol^{-1})	15873.6	58128.4	222691.0	349943.0	417460.8
K_a ($b\ \gamma_e^{-1}$)	16143.4	58986.2	225638.8	354108.9	420645.3
R^2	0.9891	0.9744	0.8993	0.8608	0.9922
χ^2_{red}	31.6411	36.2608	1083.7783	1867.3865	27.7859
Sips					
$Q_{max.est}$ (mg g^{-1})	224.80	260.61	257.61	249.85	250.71
b (L mg^{-1})	0.052	0.174	1.465	18.920	1.313
b (L mol^{-1})	16422.3	55312.0	465945.9	6019019.6	417644.2
n	0.969	1.308	1.069	0.027	0.9706
R^2	0.9855	0.9780	0.9122	0.7911	0.9905
χ^2_{red}	41.8043	31.2272	944.53	2802.3475	33.8665
Freundlich					
K_F [(mg g^{-1}/L $mg^{-1})^{1/n}$)]	39.43	105.76	151.83	235.07	151.91
n	2.941	5.614	7.410	63.012	7.950
R^2	0.9317	0.9315	0.8791	0.8608	0.7379
χ^2_{red}	197.5557	97.1057	1301.3921	1866.6667	938.4655
Temkin					
b_T (kJ mol^{-1})	48.45	68.09	84.29	91.50	97.74
A_T (L g^{-1})	0.501	8.930	135.79	160.96	221.60
R^2	0.9774	0.9586	0.8978	0.8565	0.8178
χ^2_{red}	65.4371	58.729	1099.8890	1924.1692	652.0215

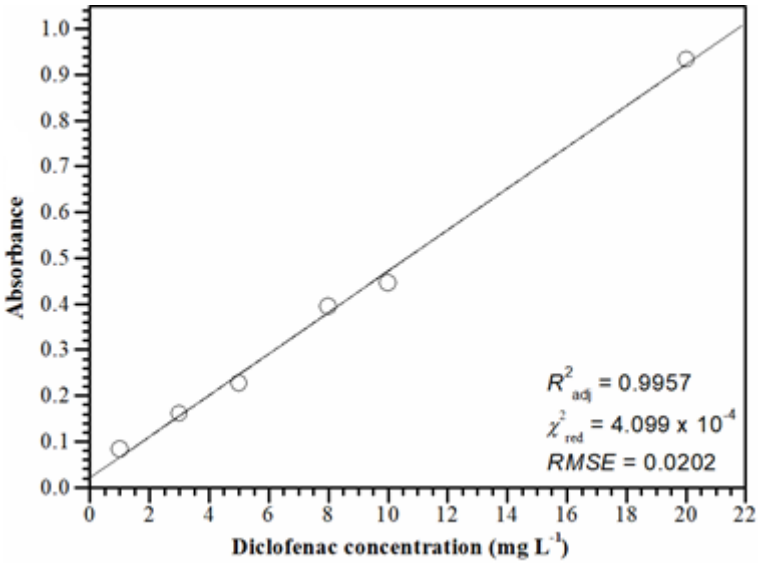


Fig. S1. Standard calibration curve for diclofenac.

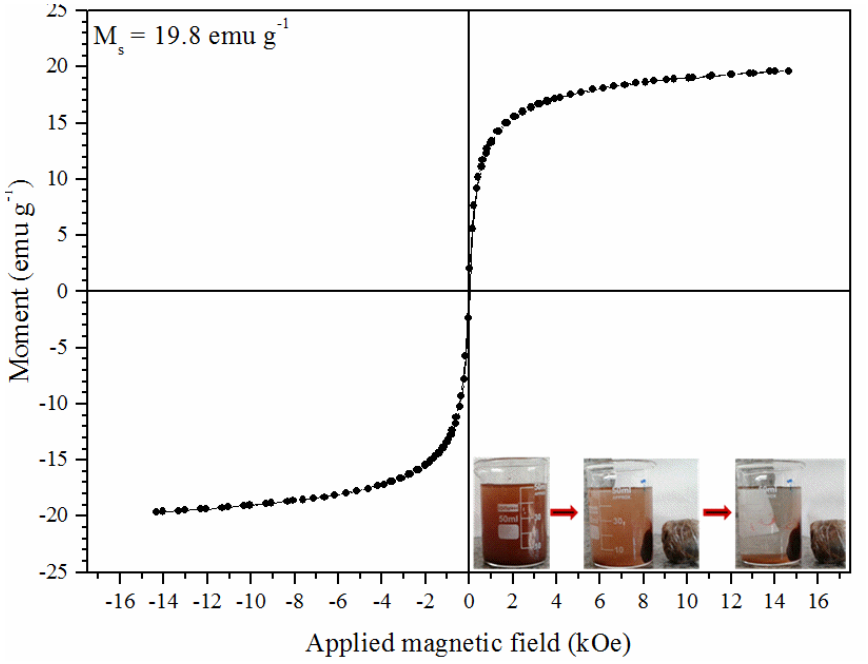


Fig. S2. Magnetization curve for the maghemite.

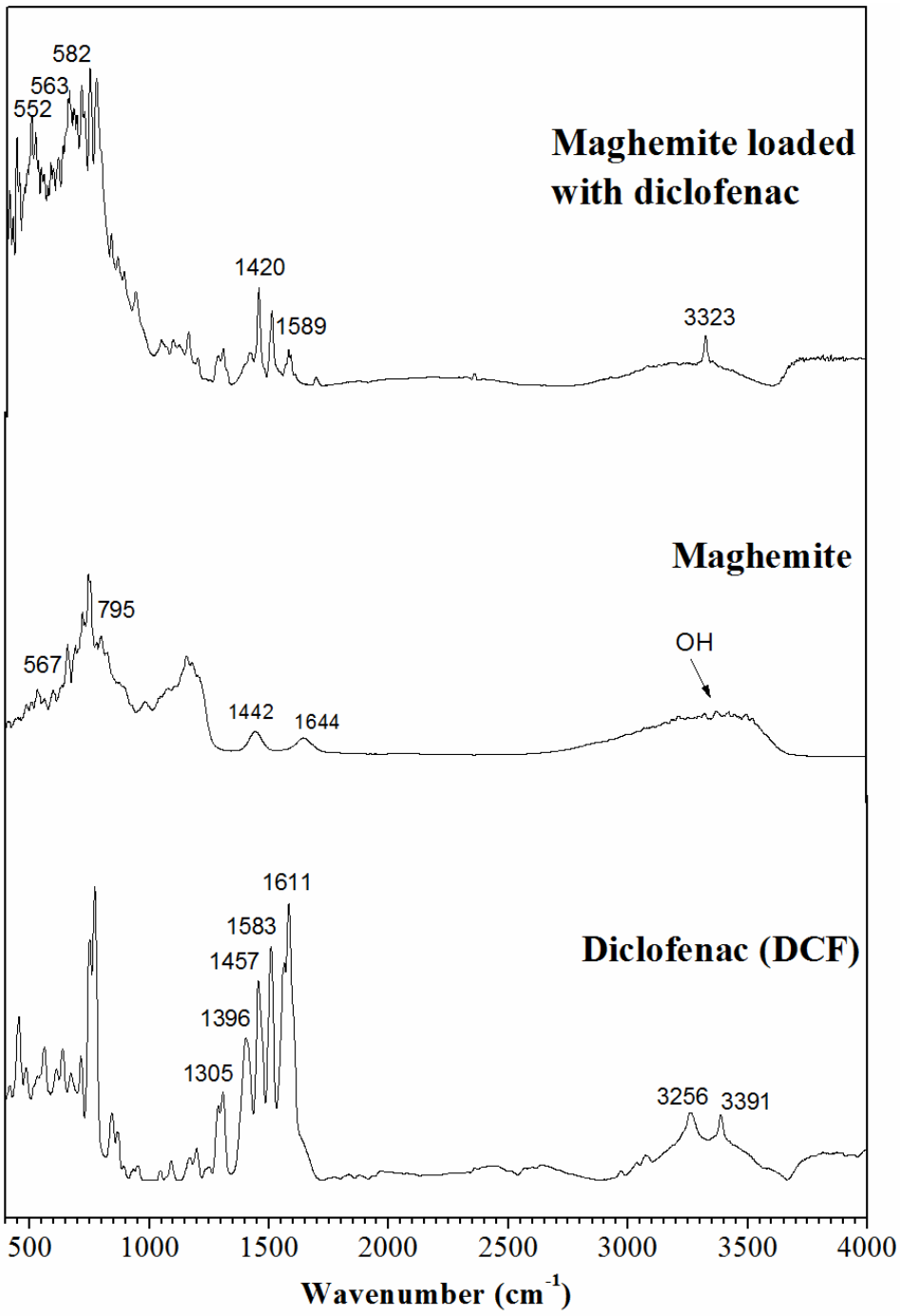
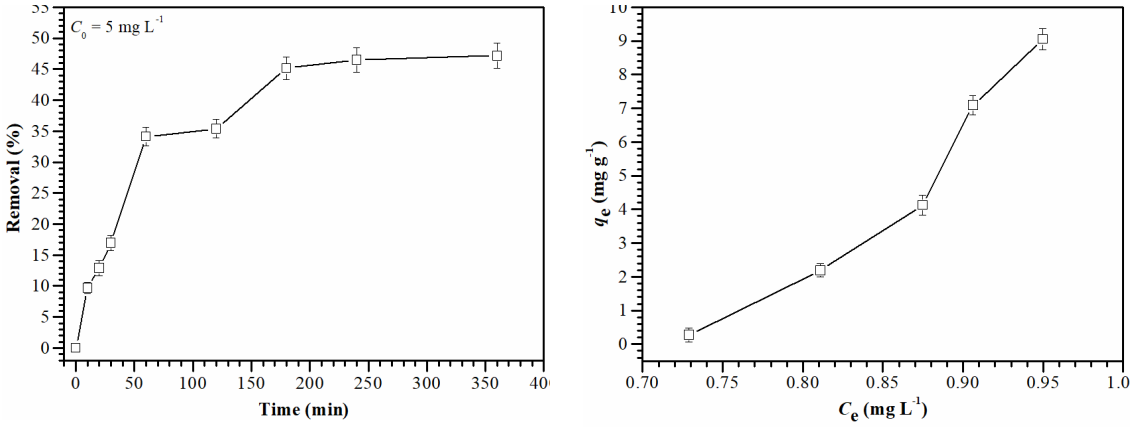


Fig. S3. Infrared spectra of DCF, maghemite, and maghemite loaded with DCF obtained by diffuse reflectance infrared Fourier spectroscopy (DRIFTS).



(a) **(b)**

Fig. S4. (a) Adsorption of 5 mg L^{-1} diclofenac by maghemite as a function of time at 298 K and (b) Adsorption isotherm at a lower concentration of diclofenac at 298 K.

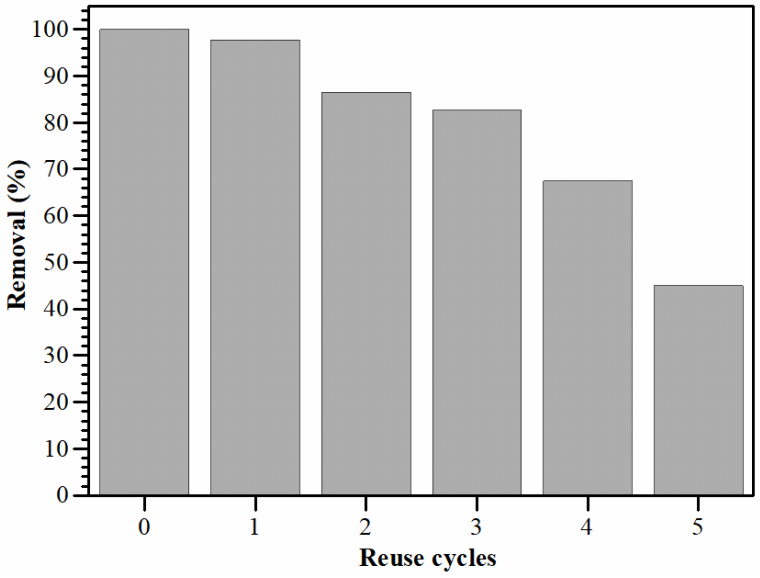


Fig. S5. Recyclability of maghemite for the DFC (5 mg L^{-1}) adsorption.