Article

Effective Interactions of Ag Nanoparticles on the Surface of SBA-15 in Performing Deep Desulfurization of Real Diesel Fuel

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SUPPLEMENTARY MATERIAL

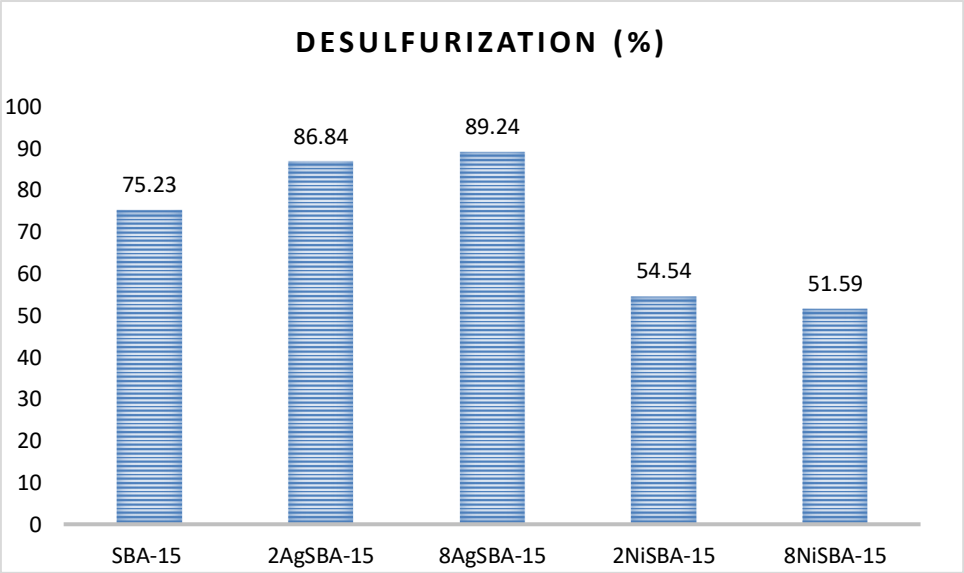

Figure S1. Preliminary results for S-compounds adsorption.

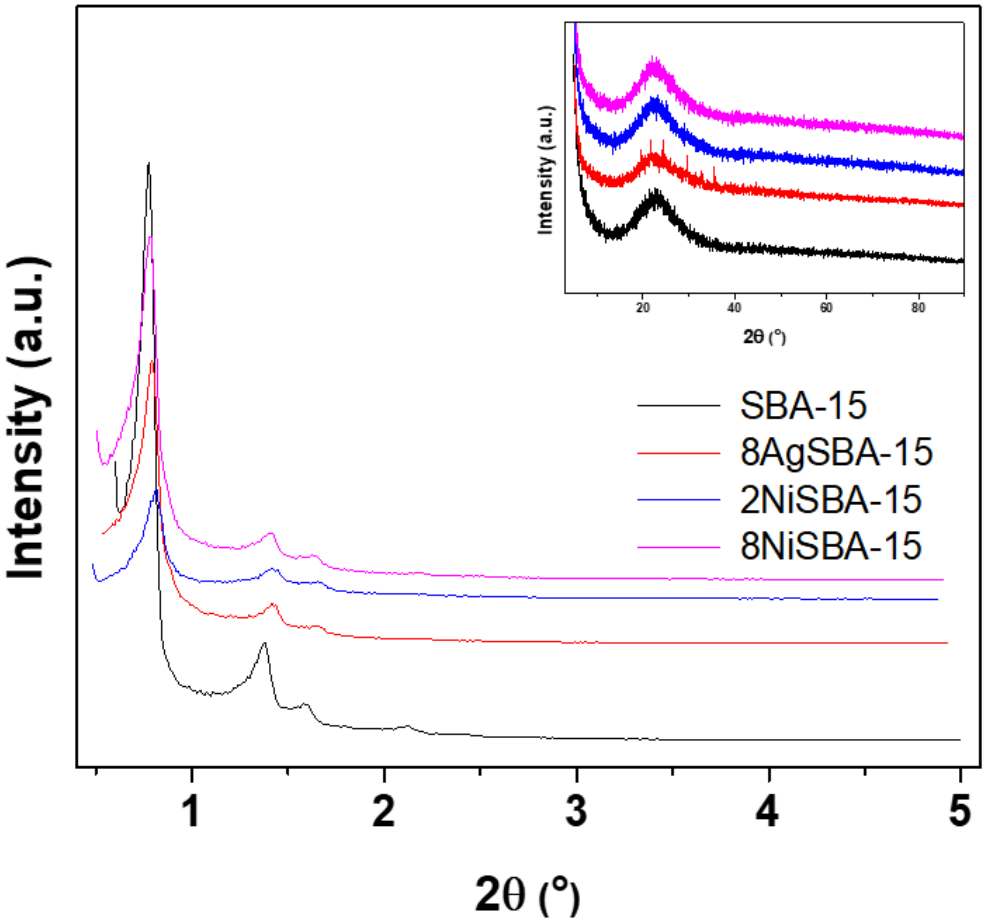

Figure S2. Low-angle and wide-angle XRD patterns for the adsorbents with 8% Ag, 2% and 8% Ni.

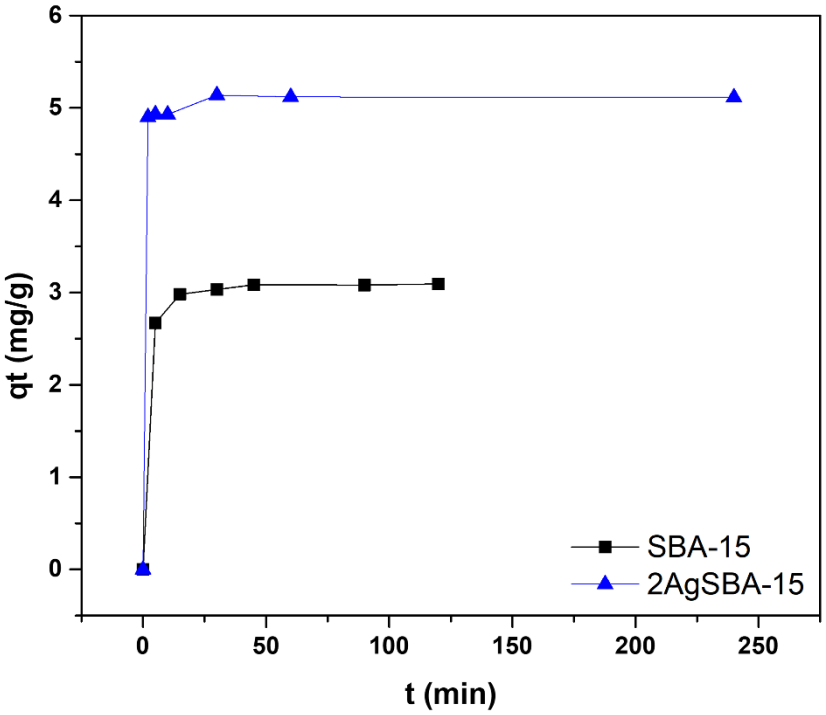

Figure S3. Amount of sulfur adsorbed per time for 2AgSBA-15 and AgSBA-15.

Table S1. Major sulfur compounds in a straight run diesel oil (Hua et al. 2003).

Compound	Content (mg/Kg)
DBTs	37.3
4-MeDBTs	71.9
2-MeDBTs	50.8
3-MeDBTs	1.2
1-MeDBTs	38.9
4-EtDBTs	15.4
4,6-DMeDBTs	38.0
Alkyl S + TPs	550
Group BTs	1900
Group DBTs	2900
Group BNTs	20
Total S	5400

Table S2. Critical diameters for the major S-aromatic molecules in real diesel.

Organosulfur	Critical diameter (Å)	Reference
Thiophene	5.3	(Van der Voorde et al. 2015)
Benzothiophene	6.0	(Van der Voorde et al. 2015)
Dibenzothiophene	8.0	(Van der Voorde et al. 2015)
4,6-Dimethylbenzothiophene	9.0	(Jayne et al. 2005)
Ethyl mercaptan	5.1	(SIGMA-ALDRICH®)

References

Hua, R., Li, Y., Liu, W., Zheng, J., Wei, H., Wang, J., Lu, X., Kong, H., Xu, G.: Determination of sulfur-containing compounds in diesel oils by comprehensive two-dimensional gas chromatography with a sulfur chemiluminescence detector. J. Chrom. A. 2003, 1019, 101-109. https://doi.org/10.1016/j.chroma.2003.08.048.

Jayne, D., Zhang, Y., Haji, S., Erkey, C. Dynamics of removal of organosulfur compounds from diesel by adsorption on carbon aerogels for fuel cell applications. International Journal of Hydrogen Energy. 2005, 30, 1287-1293. https://doi.org/10.1016/j.ijhydene.2005.03.014.

Van der Voorde, B., Hezinová, M., Lannoeye, J., Vandekerkhove, A., Marszalek, B., Gil, B., Beurroies, I., Nachtigall, P., De Vos, D. Adsorptive desulfurization with CPO-27/MOF-74: an experimental and computational investigation. Physical Chemistry Chemical Physics. 2015, 17, 10759-10766. https://doi.org/10.1039/c5cp01063b.

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