Table S1. Reported results obtained for simultaneous ADS and AND of fuels oils.

Adsorbent	*Adsorption conditions* S /ppm	S compound	N /ppm	N compound	Amount Adsorbent	T (ºC)	Time	mg *S adsorbed*/g adsorbent	mg *N adsorbed*/g adsorbent	Ref.
Activated Carbon (AC)	5268	DBT	520	QUI; IND; Carbazole	1:28 mass of adsorbent to mass of oil	r.t	24 h	5.8	5.6	69
$(NH_4)_2S_2O$ treated AC								5.1	6.6	
Fe NP impregnated AC	50	DBT; 4,6-DMDBT	1000	QUI; IND	-	25	10-15 days	3.33	11.5	71
Oxidized hollow mesoporous carbon nanospheres	1400	-(Real Diesel)	800	Real Diesel	0.25 g	150	25 h	14	27	76
Y zeolite	-	-	1845	IND	1 g	30	24 h	-	3.1	87
Cerium-exchanged Y zeolite									23.1	
Silica–zirconia co-gel	8200	- (LGO)	190	- (LGO)	-	30	-	-	3.71	90
Spherical mesoporous silica (YSP-1)								5.99	8.14	
Zr-Spherical mesoporous silica (YSP-2)								7.74	8.05	
Li-YSP	430	DBT	271	9-methylcarbazole	75 mg	45	48 h	0.17	8.13	91
MIL-101(Cr)	-	-	498	- (LCO)	10 mg	r.t.	16 h	-	19.6	94
MIL-100(Cr)	400	BT	400	QUI; IND	10 mg	-	1 h	4.3	29.43	95
Ethylenediamine grafted MIL-100(Cr)								3.4	8.62	
Aminomethanesulfonic acid grafted MIL-100(Cr)								4.6	32.7	
MIL-125	-	-	1000	QUI; IND	5 mg	25	1 h	-	16.2 (QUI); 8.3 (IND)	96
MIL-125-NH_2									35.6 (QUI); 27.4 (IND)	
Protonated MIL-125-NH_2									49.7 (QUI); 55.3 (IND)	
UiO-66	-	-	1000	QUI; IND	5 mg	20	6 h	-	14.2 (QUI); 14.3 (IND)	98
UiO-66-NH_2									12.4 (QUI); 17.6 (IND)	
Protonated UiO-66-NH_2									23.0 (QUI); 26.8 (IND)	
UiO-66-OH_2									19.8 (QUI); 25.3 (IND)	

Table S2. Reported results obtained for simultaneous ODS and ODN of fuel oils.

Catalyst	Oxidant	Temp. (°C)	Time (min)	S-compound	$S_{removal}$ (%)	N-compound	$N_{removal}$ (%)	Ref.
Limonite	H_2O_2	25	180	DBT	100	Quinoline	60	122
PMoV/Fe_3O_4/g-C_3N_4	H_2O_2	80	160	DBT	100	Indole Quinolone Pyrrole	>80	123

						Pyridine		
Mn-Co-Mn/Al_2O_3	NaClO	35	20	BT DBT 4,6-DMDBT	75 100 95-100	Pyridine Indole Carbazole	100 85-90 90-95	129
Mn_3O_4/GO	NaClO	25	2	DBT 4,6-DMDBT BT	100 89 85	Pyridine Indole Carbazole	100 83 81	133
MnO_2/UiO(Zr)-66	NaClO	25	3	DBT	100	Pyridine	100	134
[BMIM]PMo_{12}/ZIF-8	H_2O_2	75	60	BT, DBT, 4-MDBT, 4,6-DMDBT	90	Pyridine, Quinoline	90	120
[Gd(H_4nmp)(H_2O)$_2$]Cl·2H_2O	H_2O_2	70	120	BT, DBT, 4-MDBT, 4,6-DMDBT	88	Pyridine, Quinoline	100	119
TBAPMo_{12}Cu/CuO	H_2O_2	35	60	Thiophene DBT	97 98	Pyridine Carbazole	99 98	138
PWV_5/TMA-Si	. H_2O_2	70	60	BT DBT 4,6-DMDBT	80 100 90	Quinoline	100	139
LaW_{10}/LDHs	H_2O_2	65	80 45 90	BT DBT 4,6-DMDBT	99 100 99	Quinoline, Pyridine, Indole	99 99 99	140
H_3PMo_{12}@MOF-808	H_2O_2	70	60	BT DBT 4-MDBT	88 99 60	Quinoline, Indole	100 100	136
H_3PMo_{12}@MIL-100(Fe)	H_2O_2	70	30	BT DBT 4-MDBT 4,6-DMDBT	92 100 100 98	Quinoline, Indole	100 100	137

Table S3. Reported results obtained for photocatalytic processes for desulfurization (PODS) and denitrogenation (PODN) of fuel oils.

	Irradiation	**Oxidant**	**Compounds**		**Removal efficiency**		**Time (min)**	**T (° C)**	**Reused times**	**Ref.**
			PODS	**PODN**	**PODS**	**PODN**				
CuOrod/MWW	UV-C	H_2O_2	BT	IND	97.67%	99.99%	75	60	5	141
Na(0.3)-CN	visible light	molecular O_2	Th	Py	461.6 μg g^{-1}	402.1 μg g^{-1}	360	RT	4 for PODN	142
Ti_3C_2/g-C_3N_4	Visible light	atmospheric O_2	Th	Py	270.7 μg g^{-1}	245.2 μg g^{-1}	360	0	6	143
30PW_{12}/Ce-NUiO-66	Visible light	Molecular O_2	DBT	Qu	89%	99%	90		4	144
Er/W-N-TiO_2	Visible light	H_2O_2	Th, BT, DBT 4,6-DMDBT	Qu, IND and carbazole	100%	100%	25	70	10	145
Ir/Pr-N-CQDs-TiO_2	ultraviolet	H_2O_2	BT, DBT, 4,6-DMDBT	Qu, IND and carbazole	99.8%	95.5%	50	100	11	146