

Abbreviations

15 wt% HPA/MO ₂	15 w/w percent of heteropoly acid dispersed on TiO ₂ or ZrO ₂
AAS	Atomic Absorption Spectroscopy
ACN	Acetonitrile
APTES	Aminopropyltriethoxysilane
BET	Brunauer-Emmett-Teller
BJH	Barret-Joyner-Halenda
DCE	1,2 dichloroethane
DRS-UV-Vis	Diffuse Reflectance Scattering Ultra-Violet Visible Spectroscopy
EO ₂₀ -PO ₇₀ -EO ₂₀	Polyethylene glycol-Polypropylene glycol-Triblock copolymer
EDX or EDAX	Energy Dispersive X-Ray Absorption Spectroscopy
EPR	Electron Paramagnetic Resonance Spectroscopy
FT-IR	Fourier Transformed Infra-Red Spectroscopy
GC-MS	Gas Chromatography coupled with Mass Spectrometry
GLC or GC	Gas-Liquid Chromatography
HPA	Heteropoly acid
ICP	Inductively Coupled Plasma Spectroscopy
MCM-41	Mobil Composite Material (A mesoporous material)
MO ₂	TiO ₂ or ZrO ₂
Mo ₆ Al-As	(NH ₄) ₃ AlMo ₆ H ₆ O ₂₄ ·7H ₂ O, as synthesized
Mo ₆ Al-Cal	(NH ₄) ₃ AlMo ₆ H ₆ O ₂₄ ·7H ₂ O, calcined at 350 °C
MoVAIO _x	Mo ₁ V _{0.33} Al _{0.16} O _x composition of the catalyst
MoVAIO _x -1, MoVAIO _x -2, MoVAIO _x -3 and MoVAIO _x -4	Mo ₁ V _{0.33} Al _{0.16} O _x synthesized at pH conditions of 1, 2, 3 and 4, respectively
[MTCA]	Methyltricaprylammonium group
[MTCA][SbW ₉ O ₃₃] Q ₉ [SbW ₉ O ₃₃]	Sodium counter cations of Na ₉ [SbW ₉ O ₃₃] replaced by [MTCA] group (cations)
[MTCA] ⁺ Cl ⁻	Methyltricaprylammonium chloride

NH ₂ -SBA	Amino Functionalized SBA-15
NH ₂ -SBA- V _x HPA, x = 1, 2 , 3	Amino Functionalized SBA-15, on which the vanadium heteropoly acid V _x HPA is anchored
NMR	Nuclear Magnetic Resonance Spectroscopy
PMA	Phosphomolybdic (molybdophosphoric) acid
PTA	Phosphotungstic (tungstophosphoric) acid
PTC	Phase Transfer Catalyst
Q ₉ [SbW ₉ O ₃₃]	Sodium counter cations of Na ₉ [SbW ₉ O ₃₃] replaced by [MTCA] group (cations)
Raman	Fourier Transformed Raman Spectroscopy
SAXS	Small Angle X-Ray Scattering Spectroscopy
SBA-15	Santa Barbara Amorphous (A mesoporous material)
[SbW ₉ O ₃₃]	Anionic part of Na ₉ [SbW ₉ O ₃₃] polyoxometalate
SEM	Scanning Electron Microscopy
TBHP	Tertiary Butyl Hydroperoxide (aqueous)
TBHP/DCE	Tertiary Butyl Hydroperoxide extracted in 1,2 dichloroethane
TEOS	Tetraethylorthosilicate
TG-DTA	Thermogravimetry-Differential Thermal Analysis
UV-vis or UV-visible	Ultraviolet-Visible Spectroscopy
V _x HPA	Vanadium substituted heteropoly acids
V ₁ HPA	Monovanadomolybdophosphoric acid
V ₂ HPA	Divanadomolybdophosphoric acid
V ₃ HPA	Trivanadomolybdophosphoric acid
XRD	Powder X-Ray Diffraction