ABBERVIATIONS

SAC	Solid acid catalyst
STY	Space time yield
TOR	Turn over rate
TON	Turn over number
EQ	Environmental quotient
AAS	Atomic absorption spectroscopy
ICP-AES	Inductively coupled plasma – Atomic emission spectroscopy
TGA	Thermogravimetric analysis
SEM	Scanning electron microscopy
EDX	Energy dispersive X-ray spectroscopy
TPD	Temperature programmed desorption
TPR	Temperature programmed reduction
TPO	Temperature programmed oxidation
TMA	Tetravalent metal acid
HPA	Heteropoly acid
MTBE	Methyl tertiary butyl ether
ZP	Zirconium phosphate
CEC	Cation exchange capacity
TBMA	Tetravalent bimetallic acid
TMBA	Tetravalent metal bianionic
ZTP	Zirconium titanium phosphate
M(IV)PW	Metal (IV) Phosphotungstate
ZrPW	Zirconium (IV) Phosphotungstate
TiPW	Titanium (IV) Phosphotungstate
SnPW	Tin (IV) Phosphotungstate
12-TPA	12-Tungstophosphoric acid
EA	Ethyl acetate
PA	Propyl acetate
BA	Butyl acetate
BzA	Benzyl acetate
DEM	Diethyl malonate
DES	Diethyl succinate
DOP	Dioctyl phthalate
DBP	Dibutyl phthalate
R	Resorcinol
Py	Pyrogallol
Ph	Phloroglucinol
Hq	Hydroquinone

pNp	p-Nitrophenol
MA	Methyl acetoacetate
A	Anisole
V	Veratrole
AC	Acetyl chloride
BC	Benzyl chloride
T	Toluene
Nbz	Nitrobenzene
PA	Phthalic anhydride
PET	Pentaerythritol
DCCA	Drying control chemical agent
MCM	Mobil composition of matter
F	Fresh catalyst
Rg	Regenerated catalyst
Ru	Reused catalyst
Ra	Reactivated catalyst
MW	Microwave
7H4MC	7-hydroxy-4-methyl coumarin
7,8DH4MC	7,8-dihydroxy-4-methyl coumarin
5,7DH4MC	5,7-dihydroxy-4-methyl coumarin
6H4MC	6-hydroxy-4-methyl coumarin
6N4MC	6-nitro-4-methyl coumarin
p-BT	p-benzyl toluene
4-MA	4-methoxy acetophenone
3,4-DMA	3,4-dimethoxy acetophenone
2-MA	2-methyl anthraquinone
2-NA	2-nitro anthraquinone
1,3-DHA	1,3-dihydroxy anthraquinone
1,4-DHA	1,4-dihydroxy anthraquinone
DCM	Dichloromethane