

ESI for

Promotional effect of iron oxide on the catalytic properties of Fe-MnO_x/TiO₂ (Anatase) Catalysts for the SCR reaction at low temperatures

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1. Original TEM image and element mapping of $\text{MnO}_x/\text{TiO}_2$ and $\text{Fe(1.0)-MnO}_x/\text{TiO}_2$

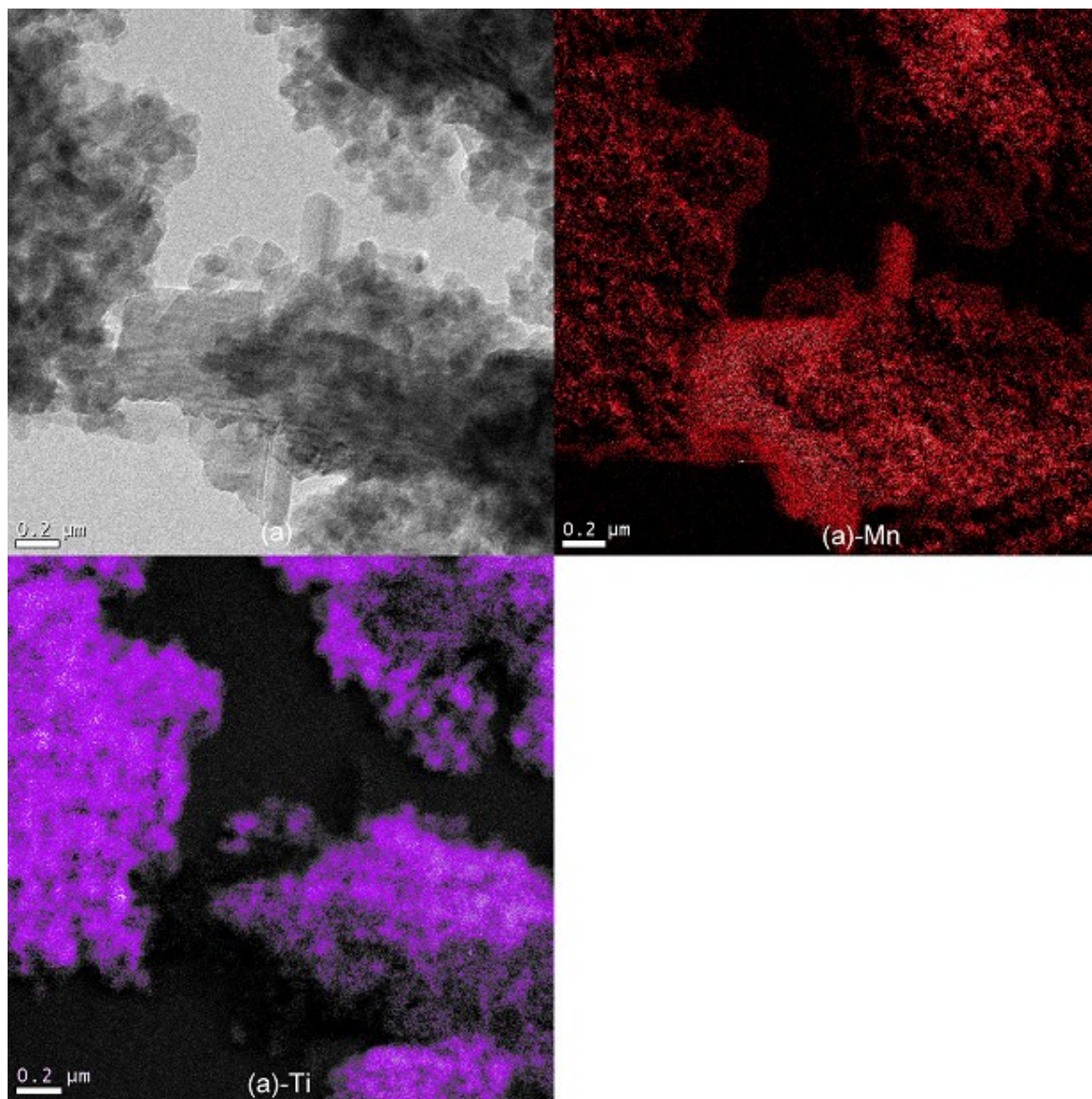


Figure S1. Original TEM image and element mapping of $\text{MnO}_x/\text{TiO}_2$

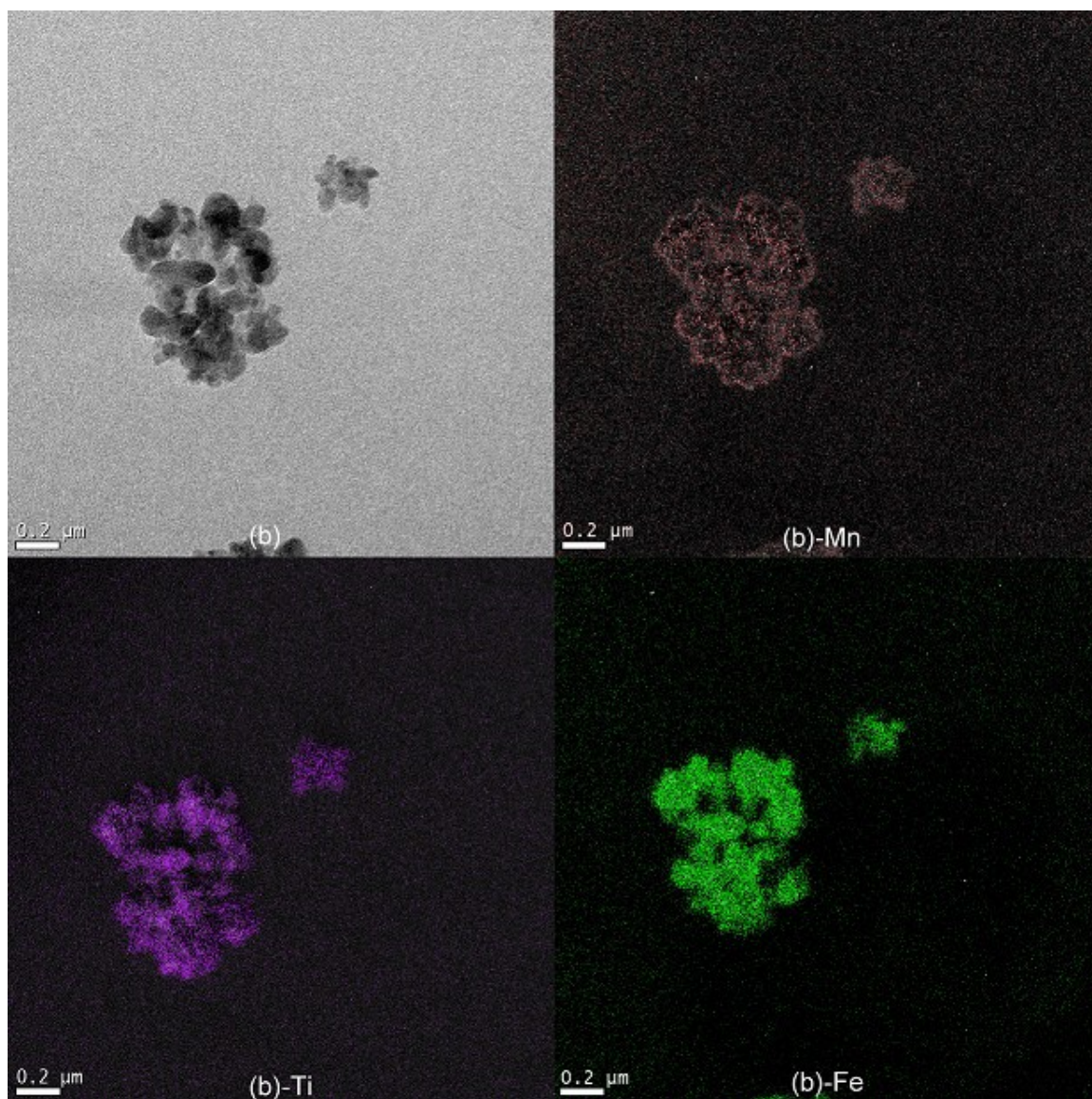


Figure S2. Original TEM image and element mapping of Fe(1.0)-MnO_x/TiO₂

2. SEM images of $\text{MnO}_x/\text{TiO}_2$ and $\text{Fe}(1.0)\text{-MnO}_x/\text{TiO}_2$

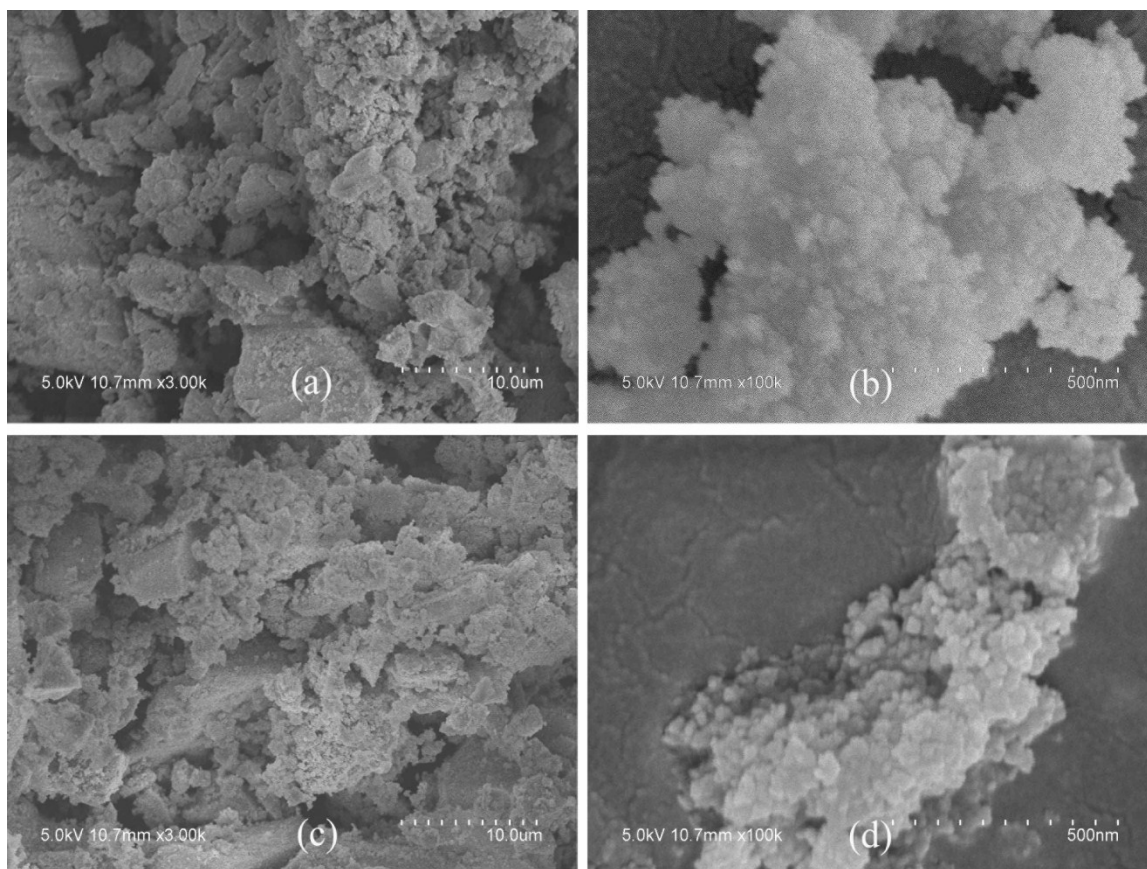


Figure S3. SEM images (a), (b) for $\text{MnO}_x/\text{TiO}_2$ catalyst and (c), (d) for $\text{Fe}(1.0)\text{-MnO}_x/\text{TiO}_2$ catalyst

3. Investigations of element valences on catalyst surfaces by XPS spectra

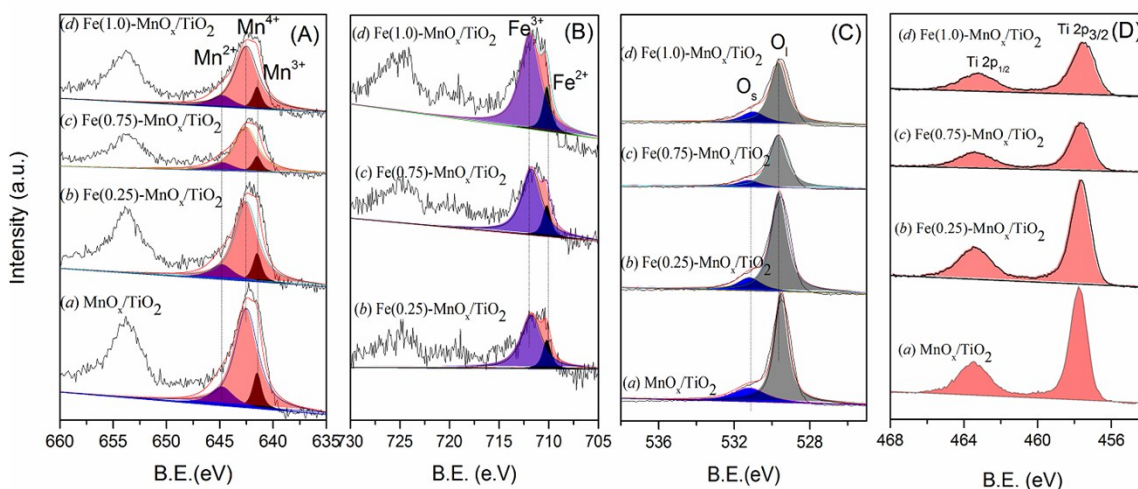


Figure S4. XPS spectra of (A) Mn 2p, (B) Fe 2p, (C) Ti 3d, (D) O 1s of Fe-MnO_x/TiO₂ catalysts with different Fe/Mn molar ratios

Table S1. The surface elements BE (eV) composition determined by XPS (C 1s =284.6 eV)

XPS spectra	Element species	Binding Energy (percentage of valence species%)			
		MnO _x /TiO ₂	Fe(0.25)-MnO _x /TiO ₂	Fe(0.75)-MnO _x /TiO ₂	Fe(1.0)-MnO _x /TiO ₂
Mn 2p	Mn ²⁺	644.8(14)	644.8(14)	644.8(14)	644.8(14)
	Mn ⁴⁺	642.5(77)	642.5(75)	642.5(75)	642.5(75)
	Mn ³⁺	641.5(9)	641.5(11)	641.5(11)	641.5(11)
Fe 2p	Fe ³⁺	-	711.7(81)	711.7(83)	711.7(83)
	Fe ²⁺	-	710.2(19)	710.2(17)	710.2(17)
O 1s	O ²⁻	529.0(24)	529.1(16)	529.1(16)	529.1(22)
	OH ⁻	531.4(76)	531.4(84)	531.4(84)	530.7(78)

4. DRIFT experiments of catalysts

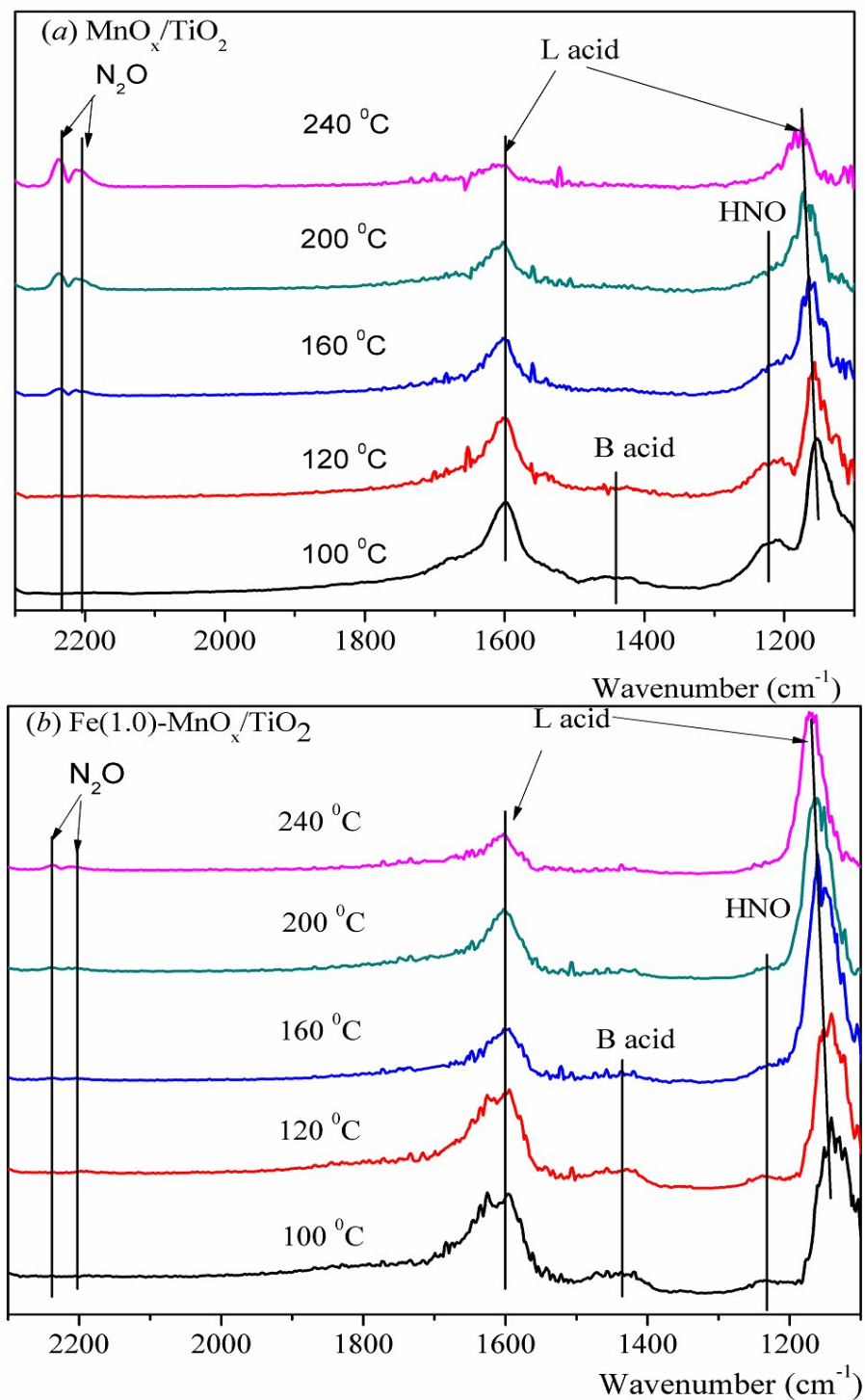


Figure S5. DRIFT spectra of the catalysts.