

Supporting Information

Mechanochemically synthesized supported magnetic Fe-nanoparticles as catalysts for efficient vanillin production

María Dolores Márquez - Medina,^a Daily Rodríguez-Padrón,^a Alina M. Balu,^a Antonio A. Romero,^a Mario J. Muñoz-Batista,^{a*} Rafael Luque^{a,b*}

^aDepartamento de Química Orgánica, Universidad de Córdoba, Campus de Rabanales, Edificio Marie Curie (C-3), Ctra Nnal IV-A, Km 396, E14014, Cordoba, Spain. M.J.M-B qo2mubam@uco.es, R.L. rafael.luque@uco.es

^bScientific Center for Molecular Design and Synthesis of Innovative Compounds for the Medical Industry, People's Friendship University of Russia (RUDN University), 6 Miklukho-Maklaya str., 117198 Moscow, Russia.

Table S1. Summary of synthesized samples and magnetic susceptibility measurements.

Catalyst	Precursor	Fe wt % (theoretical)	Calcination Temperature (°C)	Magnetic Susceptibility (m ³ K g ⁻¹)
10% FeMagC-300	ammonium iron (III) citrate	10	300	-
20% FeMagC-300		20		52.0·10 ⁻⁶
30% FeMagC-300		30		85.6·10 ⁻⁶
40% FeMagC-300		40		116.5·10 ⁻⁶
50% FeMagC-300		50		135.0·10 ⁻⁶
10% FeMagC-400		10	400	-
20% FeMagC-400		20		63.3·10 ⁻⁶
30% FeMagC-400		30		96.1·10 ⁻⁶
40% FeMagC-400		40		140.1·10 ⁻⁶
50% FeMagC-400		50		186.1·10 ⁻⁶
10% FeMagC-500		10	500	-
20% FeMagC-500		20		31.2·10 ⁻⁶
30% FeMagC-500		30		50.0·10 ⁻⁶
40% FeMagC-500		40		97.2·10 ⁻⁶
50% FeMagC-500		50		135.4·10 ⁻⁶
10% FeMagN-300		10	300	-
20% FeMagN-300		20		55.2·10 ⁻⁶

30% FeMagN-300	iron (III) nitrate	30	400	$152.0 \cdot 10^{-6}$
40% FeMagN-300		40		$233.2 \cdot 10^{-6}$
50% FeMagN-300		50		-
10% FeMagN-400		10		-
20% FeMagN-400		20		$68.6 \cdot 10^{-6}$
30% FeMagN-400		30	500	$164.3 \cdot 10^{-6}$
40% FeMagN-400		40		$271.6 \cdot 10^{-6}$
50% FeMagN-400		50		-
10% FeMagN-500		10		-
20% FeMagN-500		20		-
30% FeMagN-500		30	300	$178.9 \cdot 10^{-6}$
40% FeMagN-500		40		$254.5 \cdot 10^{-6}$
50% FeMagP-500		50		-
10% FeMagP-300	iron (III) perchlorate hydrate	10	400	-
20% FeMagP-300		20		-
30% FeMagP-300		30		-
40% FeMagP-300		40		-
50% FeMagP-300		50		-
10% FeMagP-400		10	500	-
20% FeMagP-400		20		-
30% FeMagP-400		30		-
40% FeMagP-400		40		-
50% FeMagP-400		50		-
10% FeMagP-500		10	300	-
20% FeMagP-500		20		-
30% FeMagP-500		30		-
40% FeMagP-500		40		-
50% FeMagP-500		50		-
10% FeMagCl-300	iron (III) chloride	10	400	-
20% FeMagCl-300		20		-
30% FeMagCl-300		30		-
40% FeMagCl-300		40		-
50% FeMagCl-300		50		-
10% FeMagCl-400		10	500	-
20% FeMagCl-400		20		-
30% FeMagCl-400		30		-
40% FeMagCl-400		40		-
50% FeMagCl-400		50		-
10% FeMagCl-500		10	300	-
20% FeMagCl-500		20		-
30% FeMagCl-500		30		-
40% FeMagCl-500		40		-
50% FeMagCl-500		50		-

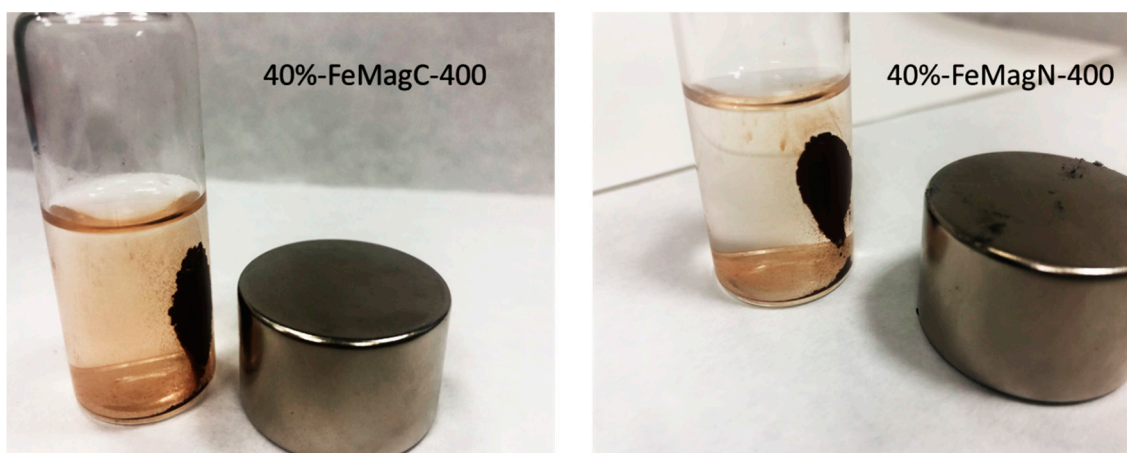


Figure S1. Magnetic separation of synthesized samples dispersed in the reaction media.

Table S2. Catalytic properties and reaction temperature of Fe-containing catalysts during isoeugenol and vanillin alcohol oxidation reactions.

Sample	Conversion (%) isoeugenol oxidation/ Selectivity %	Conversion (%) vanillin alcohol oxidation/ Selectivity (%)	Temperature (°C)	Ref.
FeMagN-400	94/56	99/99	25	This work
Fe-Al-SBA-15	90/55	n.m.	90	12
Fe-Humins	91/63	n.m.	150	13
Fe-Graphene	62/52	n.m.	90	54
Fe-Al-SBA-15 ^a	n.m.	63/99	25	19
Fe-Al-SBA-15 ^a	n.m.	99/99	50	19

^a Same synthetic protocol using propionic acid. n.m denote not measured.