Electronic Supplementary Material (ESI) for Green Chemistry.

Simplifying Levulinic Acid Conversion Towards a Sustainable Biomass Valorisation

Chiara Defilippi[1], Daily Rodríguez-Padrón[2] , Rafael Luque[2,3], Cristina Giordano[*,1]

[1]*School of Biological and Chemical Sciences, Chemistry Department, Queen Mary University of London, Mile End Road, London E1 4NS, United Kingdom*

[2]*Departmento de Quimica Organica, Facultad de Ciencias, Universidad de Cordoba, Campus de Rabanales, Edificio Marie Curie (C-3), Ctra Nnal IV-A, Km 396, E14014 Cordoba, Spain*

[3]*Peoples Friendship University of Russia (RUDN University), 6 Miklukho Maklaya str., 117198, Moscow, Russia*

*c.giordano@qmul.ac.uk

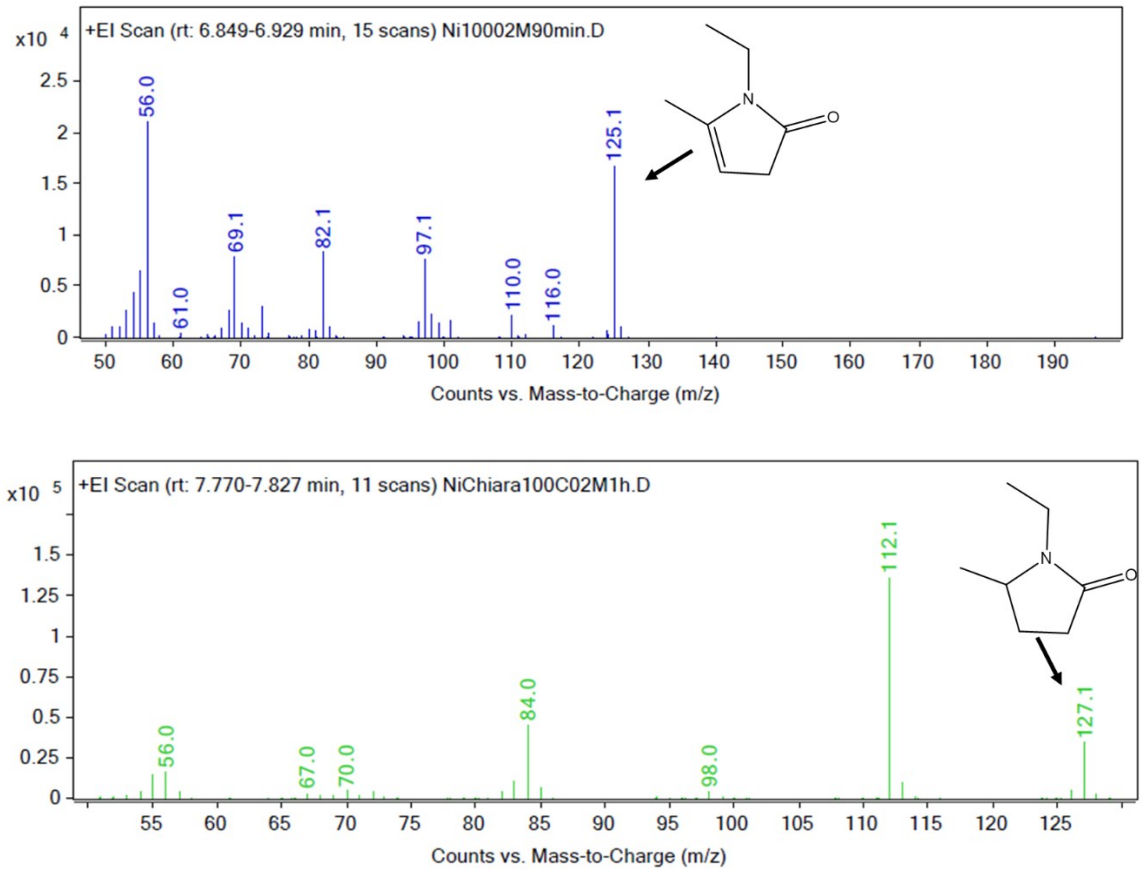

Figure SI 1. GC-MS spectra of the two products obtained (P1 and P2) from the continuous flow conversion of levulinic acid to nitrogen-heterocycles using Ni-based catalysts.

Table SI1. Peak assignment in the Nickel region for Ni^0, Ni_3N and Ni_3N + Ni^0 before and after the reaction.

Ni $2p_{3/2}$	**Position (eV)**	**Assignment**	**Comment/reference**
Ni^0	852.5/855.2	Ni^0/Ni^{2+}	[1,2]
Ni_3N	852.3/855.5	Ni^0/Ni^{2+}	
Ni_3N + Ni^0	852.5/855.4	Ni^0/Ni^{2+}	
Ni^0-tested	852.8/856.1	Ni^0/Ni^{2+}	
Ni_3N -tested	852.6/855.6	Ni^0/Ni^{2+}	
Ni_3N + Ni^0-tested	852.1/855.6	Ni^0/Ni^{2+}	

Table SI2. Peak assignment in the carbon region for Ni^0, Ni_3N and Ni_3N + Ni^0 before and after the reaction

C 1s	**Position (eV)**	**Assignment**	**Comment/reference**
Ni^0	284.6	C-C/C = C	[3]
Ni_3N	284.6	C-C/C = C	
Ni_3N + Ni^0	284.6	C-C/C = C	
Ni^0-tested	284.6	C-C/C = C	
Ni_3N -tested	284.6	C-C/C = C	
Ni_3N + Ni^0-tested	284.6	C-C/C = C	

Table SI3. Peak assignment in the oxygen region for Ni^0, Ni_3N and Ni_3N + Ni^0 before and after the reaction

O 1s	**Position (eV)**	**Assignment**	**Comment/reference**
Ni^0	531.0	O-O	[4]
Ni_3N	530.8	O-O	
Ni_3N + Ni^0	531.0	O-O	
Ni^0-tested	531.5	O-O	
Ni_3N -tested	531.1	O-O	
Ni_3N + Ni^0-tested	531.2	O-O	

Table SI4. Peak assignment in the nitrogen region for Ni^0, Ni_3N and Ni_3N + Ni^0 before and after the reaction

N 1s	**Position (eV)**	**Assignment**	**Comment/reference**
Ni^0	-	N-Ni	[5]
Ni_3N	398.4	N-Ni	
Ni_3N + Ni^0	398.7	N-Ni	
Ni^0-tested	-	N-Ni	
Ni_3N -tested	399.0	N-Ni	
Ni_3N + Ni^0-tested	398.7	N-Ni	

References

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