Supporting Information

Behaviour of Advanced Materials in environmental aquatic media - Dissolution kinetic and dispersion stability of perovskite automotive catalysts

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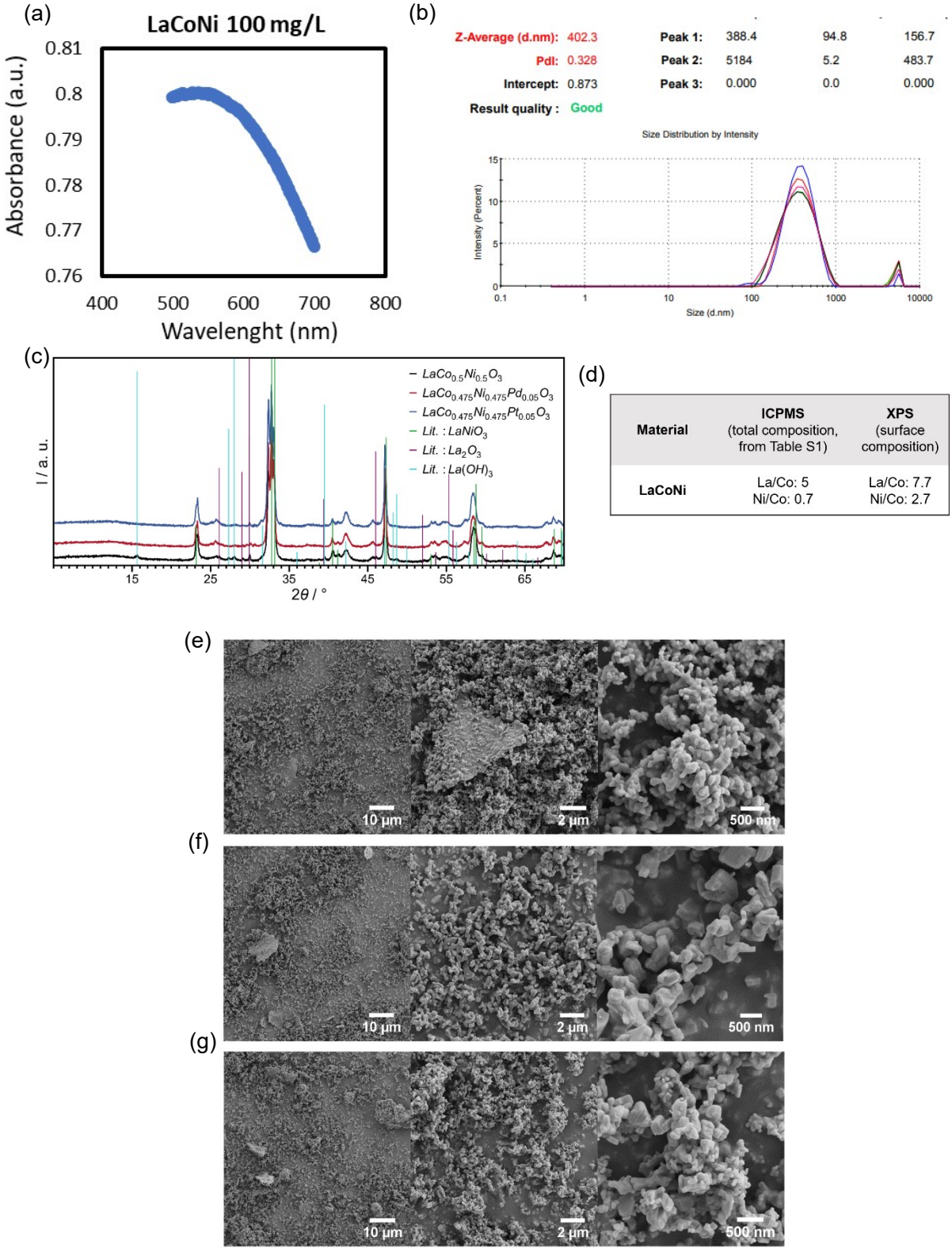


Material	ICPMS (total composition, from Table S1)	XPS (surface composition)
LaCoNi	La/Co: 5 Ni/Co: 0.7	La/Co: 7.7 Ni/Co: 2.7

Fig. S1 (a)Uv-vis absorption spectrum of LaCoNi; (b) DLS of LaCoNi stock dispersion in water; (c) XRD spectrum showing the perovskite-like crystal lattice ABO_3, with minor phases of La_2O_3 and $La(OH)_3$; (d)XPS analysis of LaCoNi showing Nickel enrichment in surface composition. (e), (f) and (g) are SEM images of LaCoNi, LaCoNi_Pd, LaCoNi_Pt, respectively.

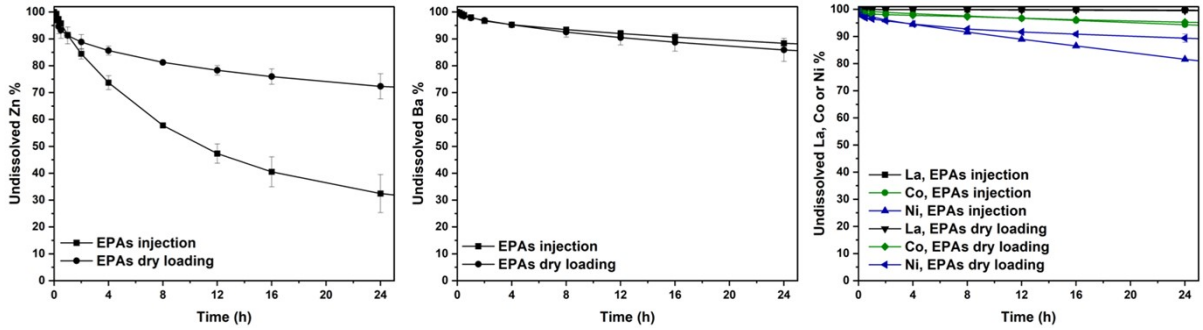
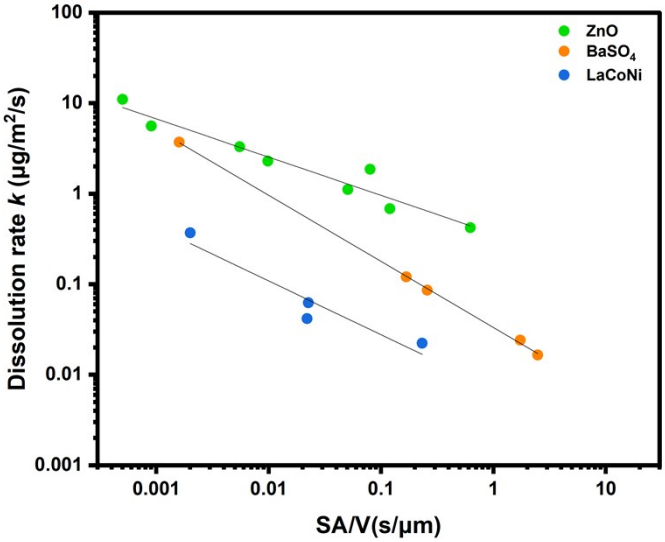


Fig. S2 Mass loss in time expressed in Undissolved metal percentage. Data are reported for EPAs in both dry loading and injection methods; from the left: ZnO, $BaSO_4$, LaCoNi.



$$y = 10^{-(b*log(x)+a)}$$

Material	Slope (b)
ZnO	-0.42
$BaSO_4$	-0.73
LaCoNi	**-0.59**

Fig. S3 Log-log linear dependency of Dissolution rates vs SA/V

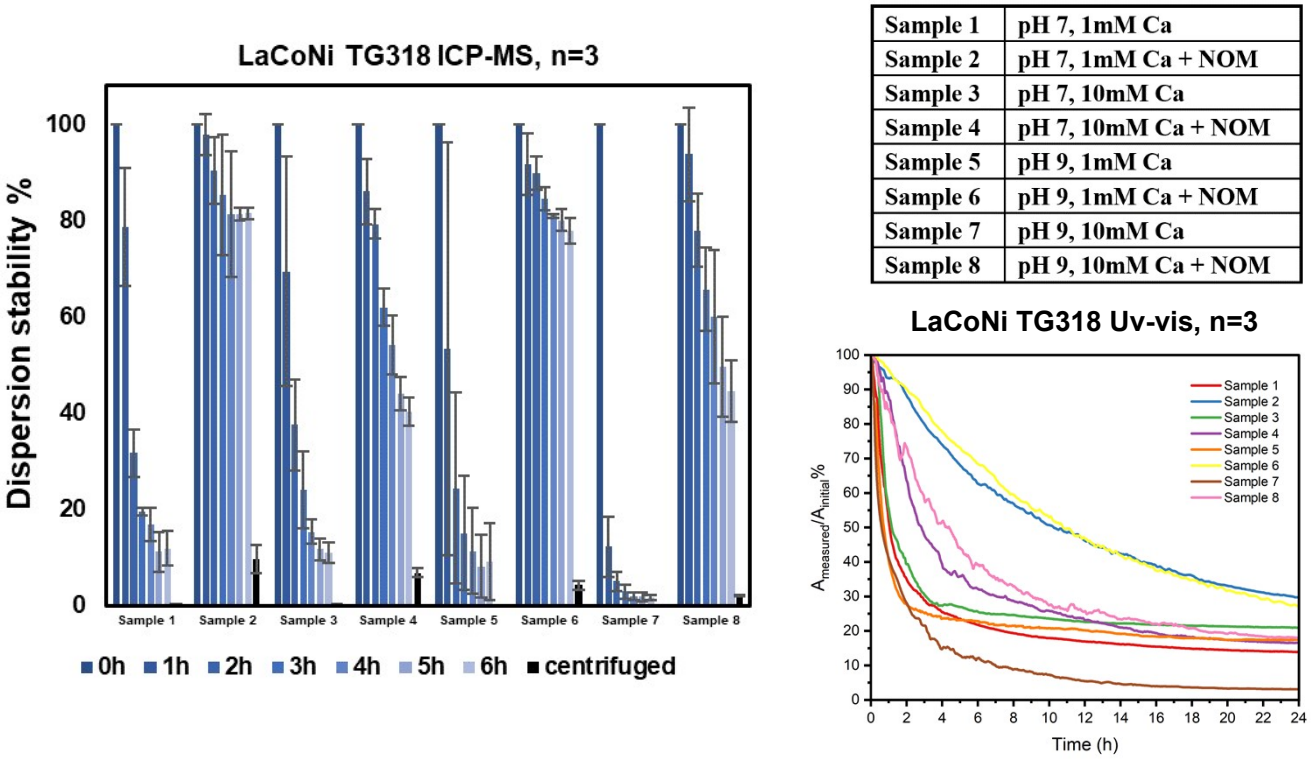


Fig. S4 Dispersion stability of LaCoNi under selected TG318 conditions

Table S1 Basic perovskites physicochemical properties: BET surface area, Min Feret diameter from SEM images, ICPMS characterization of the pristine particles, including dopants.

			ICP-MS				
Material	**BET (m^2/g)**	**Min Feret diameter in nm (SEM)***	**Co/wt.-%**	**La/wt.-%**	**Ni/wt.-%**	**Pd/wt.-%**	**Pt/wt.-%**
LaCoNi	3.8	96.1	12.0	60	8.0	n.d.	n.d.
LaCoNi_Pd	2.3	206.5	12.0	60	7.9	0.59	n.d.
LaCoNi_Pt	4.6	106.6	12.0	60	7.5	n.d.	1.1

* σ_g =1.05

Table S2 Dissolution rates at different flow rates and amount of loaded material in EPAs

	Flow rate (mL/min)	ZnO_1µg	ZnO_10µg	ZnO_100µg	ZnO_256µg	$BaSO_4$_1µg	$BaSO_4$_10µg	$BaSO_4$_100µg	LaCoNi_10µg	LaCoNi_100µg
Dissolution rate *k* [µg.m^{-2}.s^{-1}]	1	11.3±0.6	3.32±0.3	0.85±0.10	0.42±0.12	3.71±0.4	0.12±0.08	0.024±0.004	0.37±0.06	0.031±0.008
Dissolution rate *k* [µg.m^{-2}.s^{-1}]	0.5	5.57±0.5	2.29±0.1	0.68±0.11	0.36±0.12	/	/	/	/	/
Dissolution rate *k* [µg.m^{-2}.s^{-1}]	0.1	/	1.86±0.06	0.42±0.01	/	/	0.085±0.009	0.016±0.001	0.042±0.003	0.022±0.003

*dissolution rates are the average rates prior reaching 10% of undissolved single metal ion, according to Keller et al. 2020