The Effect of a Nitrogen-Based Ionic Liquid as a Coating over 1Pd9Ag/Al_2O_3 for the Selective Hydrogenation of 1,7-Octadiene *vs* 1-Octene

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Supplementary Information

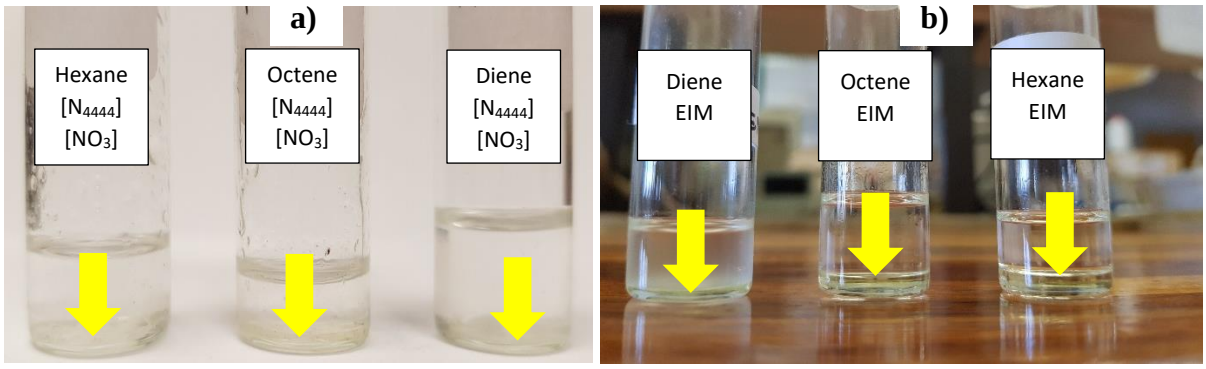

Figure S1: Solubility tests of a) [N_{4444}][NO_3] and b) [EMIM] in 1,7-octadiene, 1-octene and hexane.

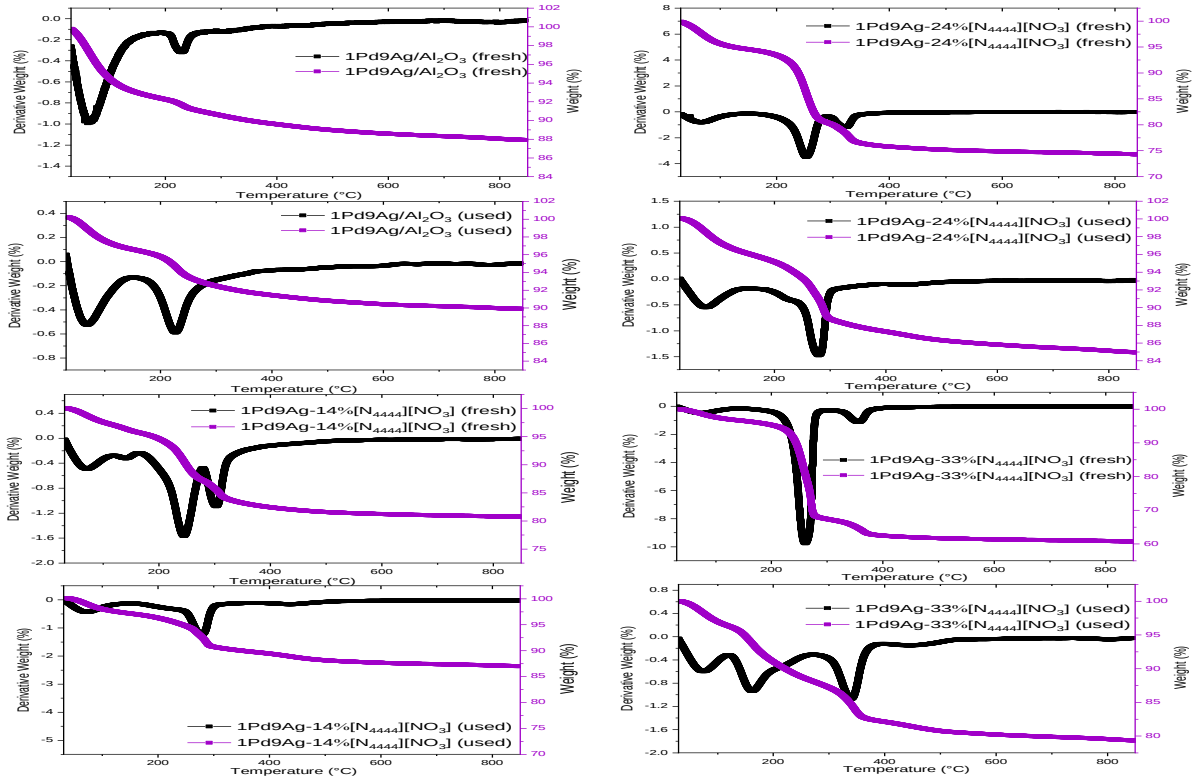

Figure S2: Weight loss and derivative weight % curves of the fresh and used 1Pd9Ag/Al_2O_3 catalysts coated with [N_{4444}][NO_3] corresponding to 1 ML, 2ML and 3 ML.

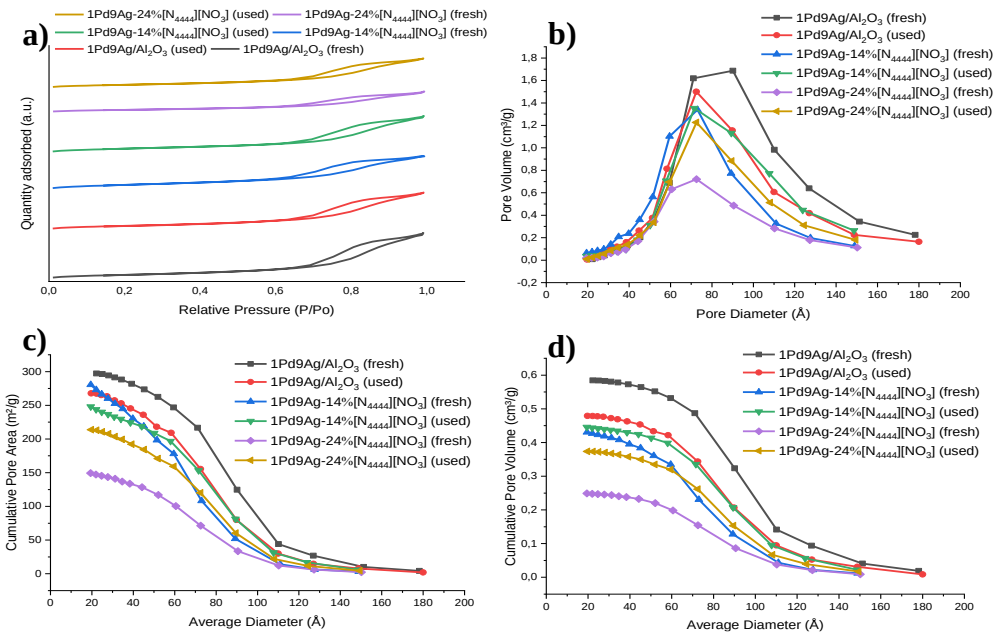

Figure S3: BET measurements of the fresh and used PdAg/Al_2O_3-SCILL systems showing a) N_2 adsorption/desorption isotherms, (b) pore size distribution plots, c) cumulative pore area and d) cumulative pore volume.

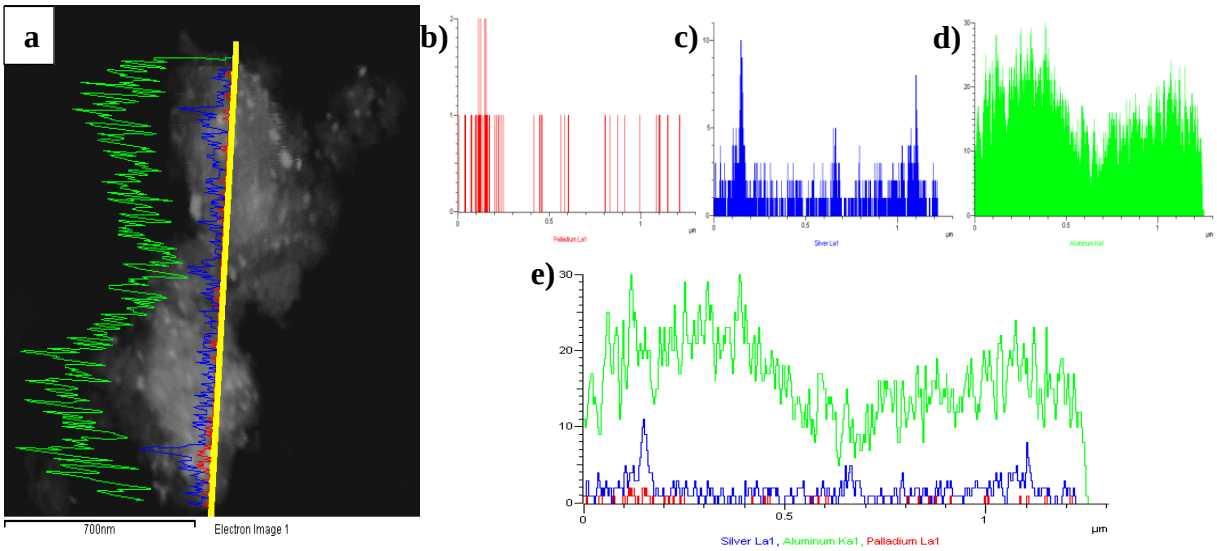

Figure S4: STEM-EDX line scans over the fresh 1Pd9Ag/Al_2O_3 catalyst showing (a) BSE image, (b) line scan of Pd (red), (c) line scan of Ag (blue), (d) line scan of Al (green) and (e) combined line scans of Pd, Ag and Al.

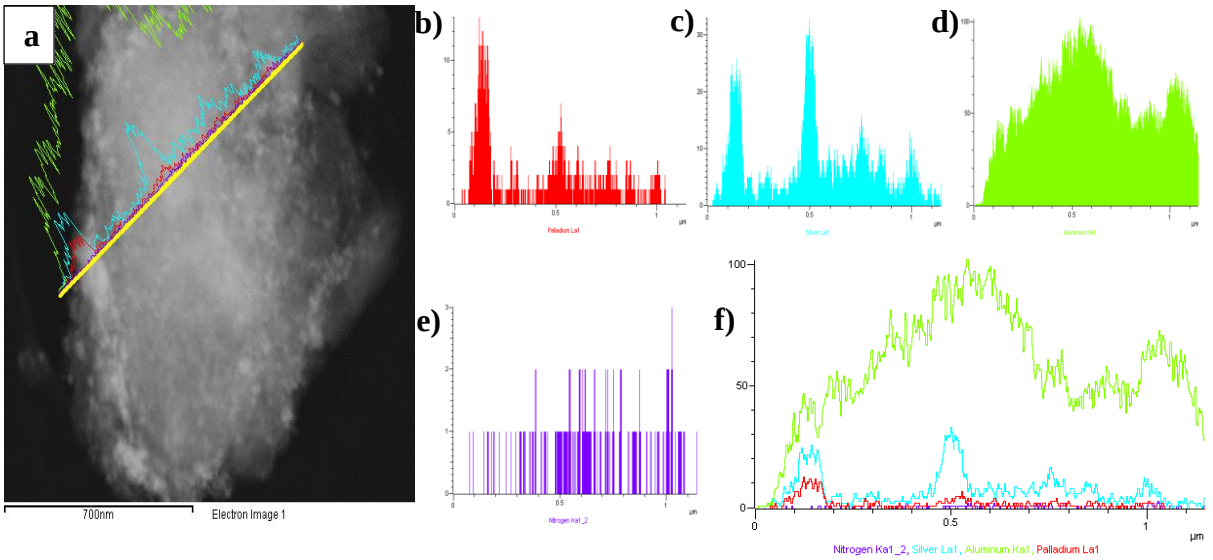

Figure S5: STEM-EDX line scans over the fresh 1Pd9Ag-14%[N_{4444}][NO_3] catalyst showing (a) BSE image, (b) line scan of Pd (red), (c) line scan of Ag (cyan), (d) line scan of Al (green), (e) line scan of N (blue) and (e) combined line scans of Pd, Ag and Al and N.

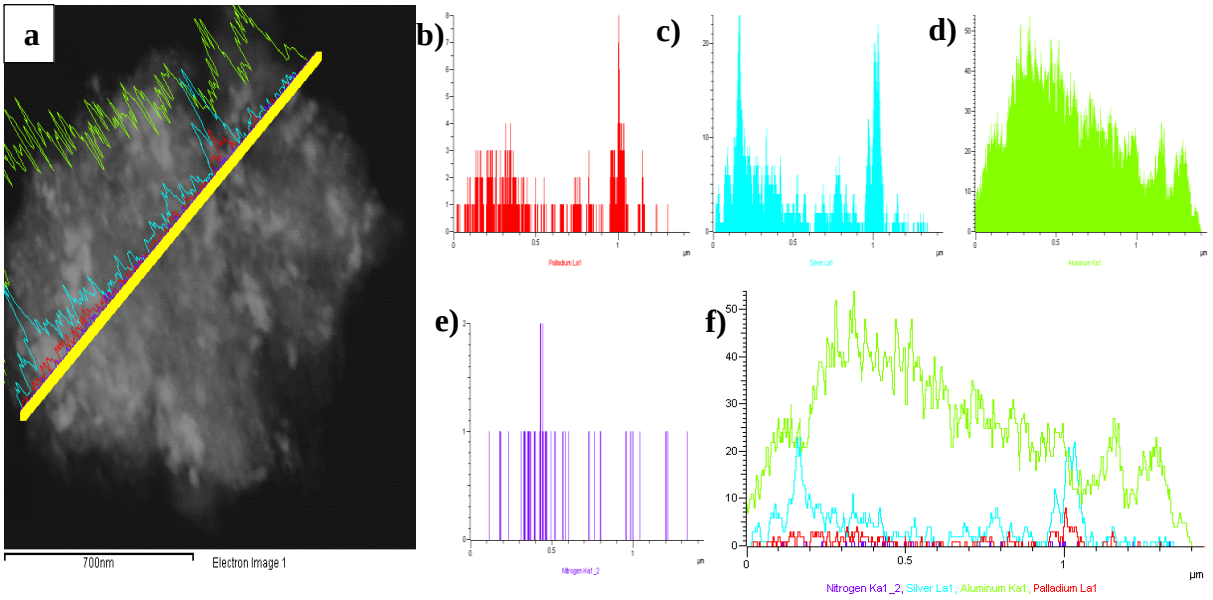

Figure S6: STEM-EDX line scans over the fresh 1Pd9Ag-24%[N_{4444}][NO_3] catalyst showing (a) BSE image, (b) line scan of Pd (red), (c) line scan of Ag (cyan), (d) line scan of Al (green), (e) line scan of N (blue) and (e) combined line scans of Pd, Ag and Al and N.

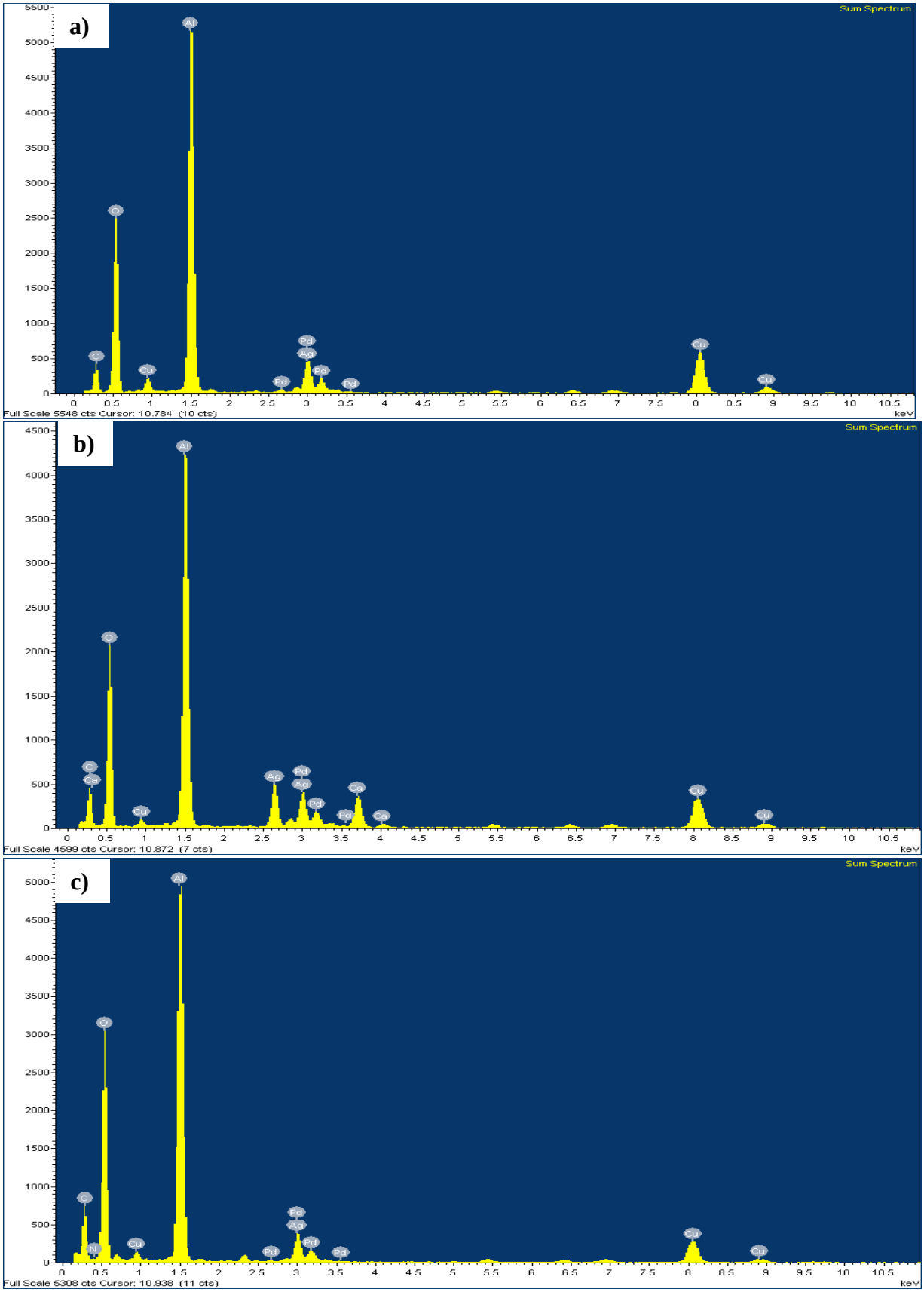

Figure S7: EDX spectra of the used catalysts: (a) 1Pd9Ag/Al_2O_3, (b) 1Pd9Ag-14%[N_{4444}][NO_3] and (c) 1Pd9Ag-24%[N_{4444}][NO_3].

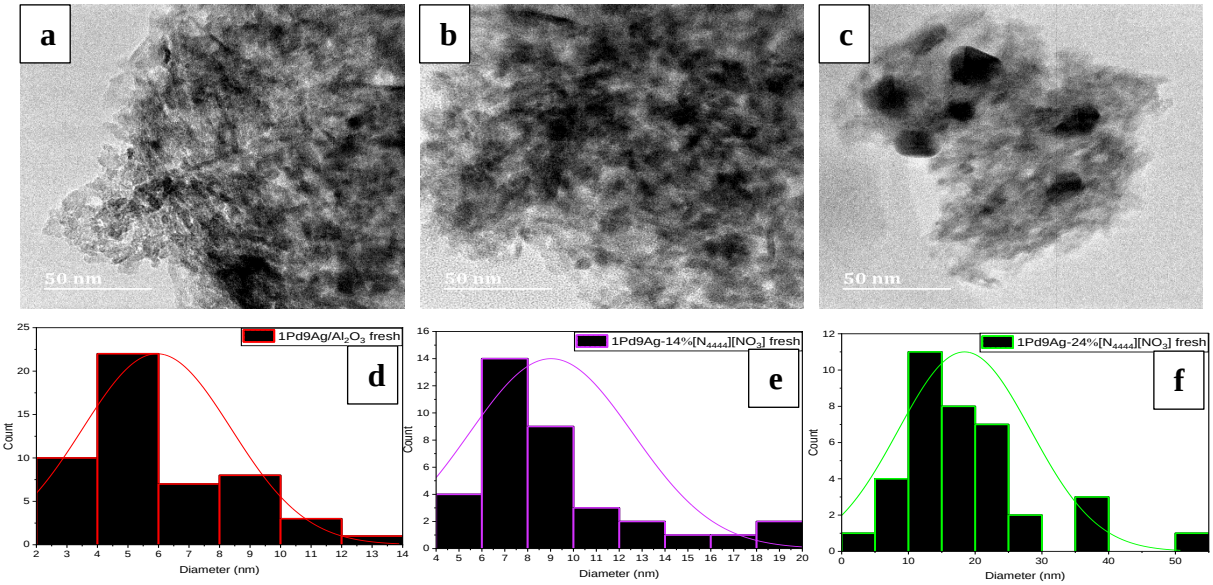

Figure S8: STEM-EDX images of fresh (a) 1Pd9Ag/Al_2O_3, (b) 1Pd9Ag-14%[N_{4444}][NO_3] and (c) 1Pd9Ag-24%[N_{4444}][NO_3] catalysts with their respective particle size distribution graphs (d-f).

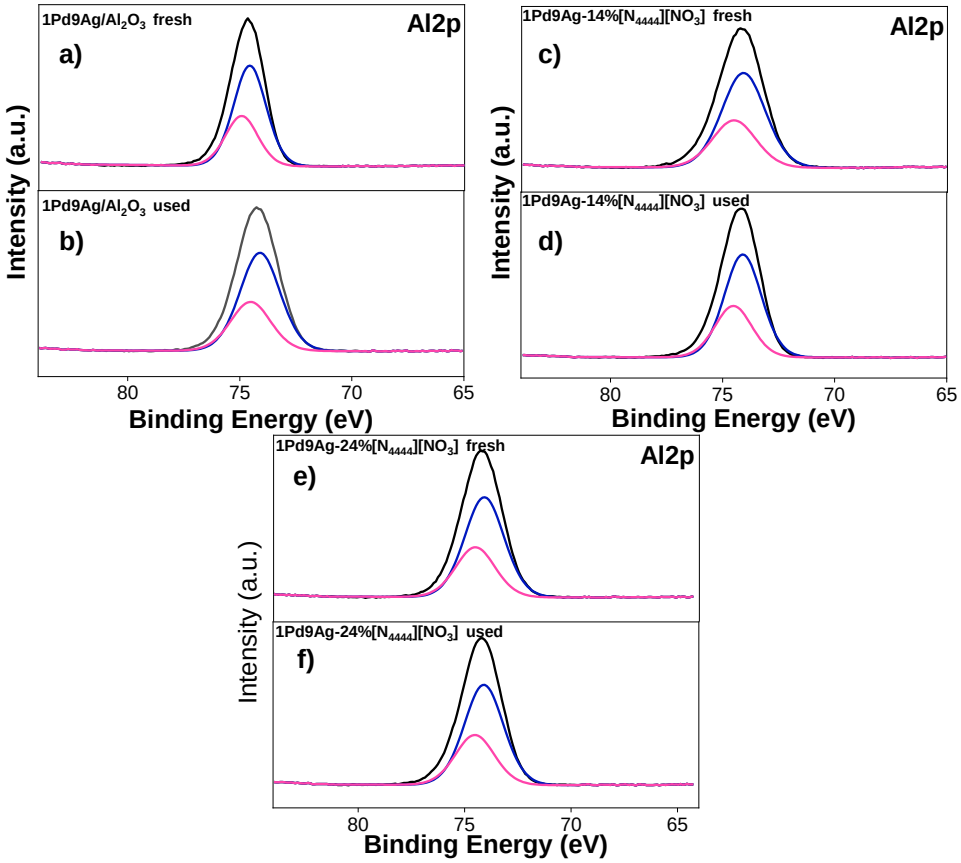

Figure S9: Al 2p XP spectra for the fresh and used uncoated and [N_{4444}][NO_3] coated catalysts. Solid black curves represent the raw data. Fitted individual components are also shown, by solid coloured curves.

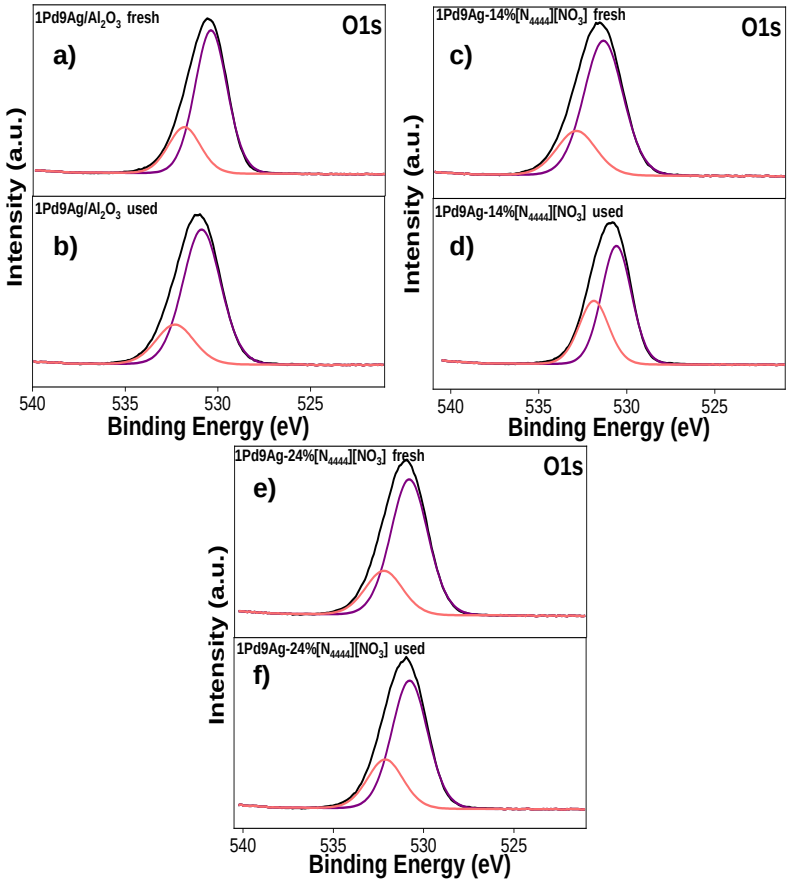

Figure S10: O 1s XP spectra for the fresh and used uncoated and $[N_{4444}][NO_3]$ coated catalysts. Solid black curves represent the raw data. Fitted individual components are also shown, by solid coloured curves.

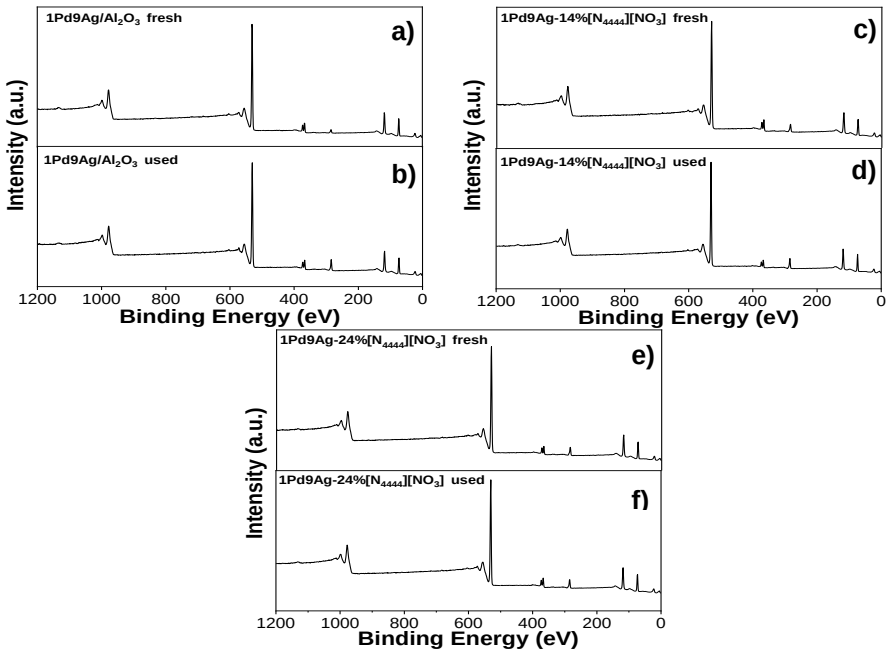

Figure S11: XPS survey spectra for the fresh and used uncoated and $[N_{4444}][NO_3]$ coated catalysts.