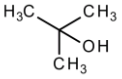
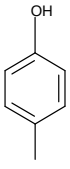
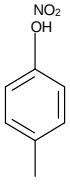
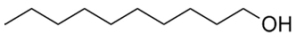
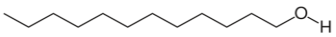
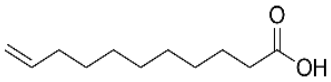
Supplementary Material

Table S1. The characteristics of the substances used for the emulsion liquid membrane preparation.

Component	Chemical formula	Molar mass (g/mol)	Density (g/cm^3)	pKa	Solubility in water (g/L)	λ (nm)
Osmium tetroxide	OsO_4	254.23	4.91	-	soluble	-
Sodium borohydride	$Na\ BH_4$	37.83	1.07	alkaline aqueous solution	soluble	-
t–butyl alcohol		74.12	0.775	16.54	miscible	-
p–Nitrophenol (pNP)		139.17	1.48	7.1	16.0	317 (phenol) 404 (phenolate)
p–Aminophenol (pAP)		109.13	1.13	5.5 10.3	15.0	317
n–decanol (nD)		158.28	0.830	15.21	0.037	197
n–dodecanol (nDD)		186.34	0.8831	16.84	0.004	201
10–undecylenic acid		184.28	0.912	5.02	0.074	-

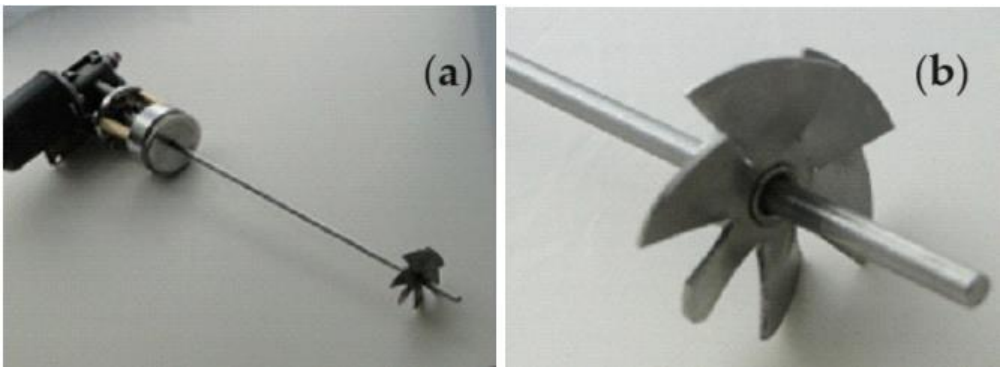


Figure S1. Helix propeller stirrer for dispersing osmium nanoparticles in n–alcohols: **(a)** overview; **(b)** detail of the stirring component.

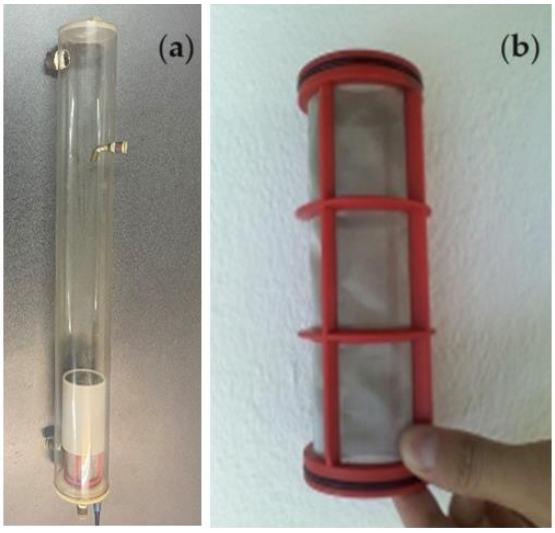


Figure S2. The p–nitrophenol reduction reaction column (a); and the detail of the emulsion (b).