Supplementary Material (ESI) for Dalton Transactions

Electronic Supplementary Information

Synthesis of zirconia sol stabilized by trivalent cations (yttrium and neodymium or americium): A precursor for Am-bearing cubic stabilized zirconia

Stephane Lemonnier, Stephane Grandjean, Anne-Charlotte Robisson, and Jean-Pierre Jolivet*

CEA, DEN, Laboratoire Chimie et Conversion des Actinides, Marcoule/DRCP/SCPS, Bât 399, BP 17171, F-30207 Bagnols sur Cèze Cedex, France

[1] Laboratoire de Chimie de la Matière Condensée, UMR CNRS 7574, Collège de France, Bât D, 11 place Marcelin Berthelot 75231 Paris, France

Table I. Composition of solids formed in the sequenced titration of metallic cations (Zr, Y and/or Nd) and acacH mixture, based on infrared spectroscopy and X-Ray diffraction data.

Exp.	Cations / mol dm^{-3}				pH	Remarks	Yields (%)				Solid characterization	
	Zr	Y	Nd	acacH			Zr	Y	Nd	acac	IR	XRD
1	0.1	0	0	0.1	pH 2-6	Unstable sol	-	0	0	-	$Zr(acac)_4$	Amo. >> Cryst.
2	0.1	0	0	0.4	pH = 4	Partial precipitation	79	0	0	75	$Zr(acac)_4$	Cryst.
3	0	0.025	0	0.025	pH = 10	Partial precipitation	0	97	0	86	$Y(acac)_3$ + $Y(OH)_3$	Amo. >> Cryst.
4	0	0.025	0	0.075	pH = 8	Partial precipitation	0	81	0	73	$Y(acac)_3$	Cryst.
5	0	0	0.025	0.025	pH = 10	Partial precipitation	0	0	93	48	$Nd(acac)_3$ + $Nd(OH)_3$	Amo. >> Cryst.
6	0	0	0.025	0.075	pH = 7	Partial precipitation	0	0	81	82	$Nd(acac)_3$	Cryst.
7	0.1	0.025	0.025	0.1	pH 2-5	Unstable sol	-	-	-	-	$Zr(acac)_4$	Amo. >> Cryst.
8	0.1	0.025	0.025	0.1	pH 6-7	Stable sol	-	-	-	-	Acac/M (*)	Amo. (*)
9	0.1	0.025	0.025	0.4	pH = 4	Partial precipitation	70	0	0	70	$Zr(acac)_4$	Cryst.
10	0.1	0.025	0.025	0.4	pH = 8	Partial precipitation	99	42	62	71	$Zr(acac)_4$ + ZrO_2,nH_2O	Cryst. + Amo.

Amo. = Amorphous. Cryst. = Crystallized. (*) Gel obtained after a few weeks