

COMPONENTS: (1) Neodymium iodide; NdI_3 ; [13813-24-6] (2) 1-Butanol; $\text{C}_4\text{H}_{10}\text{O}$; [71-36-3] (3) Water; H_2O ; [7732-18-5]	ORIGINAL MEASUREMENTS: Yastrebova, L.F.; Grigor, T.I.; Kuznetsova, G.P.; Stepin, B.D. <i>Zh. Neorg. Khim.</i> <u>1981</u> , <i>26</i> , 2238-9; <i>Russ. J. Inorg. Chem. (Engl. Transl.)</i> , <u>1981</u> , <i>26</i> , 1203-4.																		
VARIABLES: Composition at 273 K	PREPARED BY: T. Mioduski and M. Salomon																		
EXPERIMENTAL VALUES: <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th rowspan="2">solvent^b</th> <th colspan="3">solubility at 0°C</th> <th rowspan="2">solid phase</th> </tr> <tr> <th>$\text{NdI}_3 \cdot 9\text{H}_2\text{O}$ mass %</th> <th>NdI_3^{a} mass %</th> <th>mol kg^{-1}</th> </tr> </thead> <tbody> <tr> <td>n-C₄H₉OH</td> <td>57.97</td> <td>44.29</td> <td>1.514</td> <td>$\text{NdI}_3 \cdot 9\text{H}_2\text{O}$</td> </tr> <tr> <td>H₂O</td> <td>87.21</td> <td>66.63</td> <td>3.804</td> <td>"</td> </tr> </tbody> </table> <p>^aResults for the anhydrous salt calculated by the compilers.</p> <p>^bAuthors' original results reported in terms of the solubility of the nonhydrate in the pure alcohol. Accounting for the waters of hydration, the compilers calculate that at equilibrium the solvent contains 75.44 mass % alcohol and 24.56 mass % water.</p> <p>The solubility isotherm for the ternary system is reproduced at the right. Numerical data for the various compositions represented in this diagram were not given.</p>		solvent ^b	solubility at 0°C			solid phase	$\text{NdI}_3 \cdot 9\text{H}_2\text{O}$ mass %	NdI_3^{a} mass %	mol kg^{-1}	n-C ₄ H ₉ OH	57.97	44.29	1.514	$\text{NdI}_3 \cdot 9\text{H}_2\text{O}$	H ₂ O	87.21	66.63	3.804	"
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AUXILIARY INFORMATION																			
METHOD/APPARATUS/PROCEDURE: Isothermal method used. No information was given on how equilibrium was ascertained. Aliquots of saturated solution were withdrawn and analyzed for the metal complexometrically, for iodide by a potentiometric volumetric argentometric method, and for water by the Karl Fischer method. The alcohol and water contents in the mixtures were found by quantitative gas chromatography. Solid phase compositions were determined by Schreinemakers' method of residues.	SOURCE AND PURITY OF MATERIALS: The nonhydrate, $\text{NdI}_3 \cdot 9\text{H}_2\text{O}$, was synthesized according to (1,2). The alcohol was dried and purified by "recommended" methods. The source and purity of water was not specified.																		
	ESTIMATED ERROR: Nothing specified.																		
REFERENCES: 1. Yakimova, Z.P.; Kuznetsova, G.P.; Yastrebova, L.F.; Stepin, B.D. <i>Zh. Neorg. Khim.</i> <u>1977</u> , <i>22</i> , 251. 2. Belousova, A.P.; Kuznetsova, G.P.; Rukk, N.S.; Stepin, B.D. <i>Zh. Neorg. Khim.</i> <u>1979</u> , <i>24</i> , 1410.																			

COMPONENTS: (1) Neodymium iodide; NdI_3 ; [13813-24-6] (2) 1,4-Dioxane; $\text{C}_4\text{H}_8\text{O}_2$; [123-91-1]	ORIGINAL MEASUREMENTS: Kirmse, E.M.; Zwietasch, K.J.; Tirschmann, J.; Oelsner, L.; Niedergeases, U. <i>Z. Chem.</i> <u>1968</u> , <i>8</i> , 472-3. Kirmse, E.M. <i>Tr. II Vses. Konf. po Teor. Rastvorov.</i> <u>1971</u> , 200-6.
VARIABLES: Room temperature: T/K around 298	PREPARED BY: T. Mioduski
EXPERIMENTAL VALUES: <p>The solubility of NdI_3 in p-dioxane at about 25°C was given as</p> <p style="text-align: center;">1.6 mass %.</p> <p>The corresponding molality calculated by the compiler is</p> <p style="text-align: center;">0.031 mol kg^{-1}</p> <p>The nature of the solid phase was not specified.</p>	
AUXILIARY INFORMATION	
METHOD/APPARATUS/PROCEDURE: The solute-solvent mixtures were isothermally agitated at 25°C or at room temperature. Authors state that the difference found for the solubility was within experimental error limits. Nd was determined by complexometric titration. No other details given.	SOURCE AND PURITY OF MATERIALS: The anhydrous salt was prepared by the method of Taylor and Carter (1). No other information given.
	ESTIMATED ERROR: Nothing specified.
	REFERENCES: 1. Taylor, M.D.; Carter, C.P. <i>J. Inorg. Nucl. Chem.</i> <u>1962</u> , <i>24</i> , 387.

COMPONENTS: (1) Neodymium iodide; NdI ₃ ; [13813-24-6] (2) 1,2-Ethanediamine; C ₂ H ₈ N ₂ ; [107-15-3]	ORIGINAL MEASUREMENTS: Moeller, T.; Zimmerman, P.A. <i>J. Am. Chem. Soc.</i> <u>1953</u> , <i>75</i> , 3940-3.
VARIABLES: T/K = 303.15	PREPARED BY: T. Mioduski
EXPERIMENTAL VALUES: <p>The solubility of NdI₃ in H₂NCH₂CH₂NH₂ at 30°C was given as</p> <p style="text-align: center;">2.53 g/100 solvent</p> <p>The corresponding molality calculated by the compiler is</p> <p style="text-align: center;">0.0482 mol kg⁻¹</p> <p>Solid phase composition not determined.</p>	
AUXILIARY INFORMATION	
METHOD/APPARATUS/PROCEDURE: <p>The isothermal method was used. Reaction mixtures were sealed in 25 x 200 mm test tubes and thermostated for one week at 30 ± 0.05°C with frequent agitation. The density of the supernatant liquid was determined pycnometrically (but not reported in the source paper), and the neodymium content determined by precipitating the hydrous hydroxide from a measured aliquot by adding excess water, igniting to the oxide and weighing.</p> <p>All anhydrous substances were handled in a dry box through which a current of nitrogen was passed. The nitrogen was freed of CO₂ and moisture by passage through concentrated sulfuric acid, soda lime, and Drierite. All solutions were prepared in the dry box, and were sealed before being removed.</p>	SOURCE AND PURITY OF MATERIALS: <p>Nd₂O₃ was converted to the iodide by high temperature reaction with NH₄I. Unreacted NH₄I was removed by heating in N₂ followed in vacuo. The oxide labeled Nd-28 from University stocks contained traces of other rare earth metals. Ethylenediamine (Carbide and Carbon Chemicals) purified as in (1). The product had an electrolytic resistivity of 2.65 x 10⁵ ohm cm⁻¹. The solvent was stored under nitrogen in glass stoppered flasks sealed with wax.</p> ESTIMATED ERROR: Soly: precision probably 1% at best (compiler). Temp: precision ± 0.05 K (authors).
REFERENCES: 1. Putnam, G.L.; Kobe, K.A. <i>Trans. Electrochem. Soc.</i> <u>1938</u> , <i>74</i> , 609.	

COMPONENTS: (1) Neodymium iodide; NdI ₃ ; [13813-24-6] (2) Alkyl amines	ORIGINAL MEASUREMENTS: Kirmse, E. M. <i>Tr. II Vses. Konf. po Teor. Rastvorov</i> 1971, 200-6.																				
VARIABLES: T/K = 298	PREPARED BY: T. Mioduski and M. Salomon																				
EXPERIMENTAL VALUES: <table border="0" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; border-bottom: 1px solid black;">solvent</th> <th colspan="3" style="text-align: right; border-bottom: 1px solid black;">solubility^a</th> </tr> <tr> <th style="border-bottom: 1px solid black;"></th> <th style="border-bottom: 1px solid black;"></th> <th style="border-bottom: 1px solid black; text-align: center;">mass %</th> <th style="border-bottom: 1px solid black; text-align: center;">mol kg⁻¹</th> </tr> </thead> <tbody> <tr> <td>1-propanamine; n-C₃H₉N; [107-10-8]</td> <td style="text-align: center;">16.6</td> <td style="text-align: center;">0.379</td> <td></td> </tr> <tr> <td>2-propanamine; iso-C₃H₉N; [75-31-0]</td> <td style="text-align: center;">6.2</td> <td style="text-align: center;">0.126</td> <td></td> </tr> <tr> <td>1-butanamine; n-C₄H₁₁N; [109-73-9]</td> <td style="text-align: center;">8.3</td> <td style="text-align: center;">0.172</td> <td></td> </tr> </tbody> </table> <p>^aMolalities calculated by the compilers.</p>		solvent	solubility ^a					mass %	mol kg ⁻¹	1-propanamine; n-C ₃ H ₉ N; [107-10-8]	16.6	0.379		2-propanamine; iso-C ₃ H ₉ N; [75-31-0]	6.2	0.126		1-butanamine; n-C ₄ H ₁₁ N; [109-73-9]	8.3	0.172	
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1-butanamine; n-C ₄ H ₁₁ N; [109-73-9]	8.3	0.172																			
AUXILIARY INFORMATION																					
METHOD/APPARATUS/PROCEDURE: Experimental details not given, but were probably similar to previous works of the author which are compiled throughout this volume. Nature of solid phases not specified.	SOURCE AND PURITY OF MATERIALS: Nothing specified, but based on previous work by the author the anhydrous salt was probably prepared by the method of Taylor and Carter (1). ESTIMATED ERROR: Nothing specified. REFERENCES: 1. Taylor, M.D.; Carter, C.P. <i>J. Inorg. Nucl. Chem.</i> <u>1962</u> , 24, 387.																				

COMPONENTS: (1) Neodymium iodide; NdI ₃ ; [13813-24-6] (2) Ethanolamine; C ₂ H ₇ NO; [75-39-8]	ORIGINAL MEASUREMENTS: Moeller, T.; Zimmerman, P.A. <i>J. Am. Chem. Soc.</i> <u>1953</u> , 75, 3940-3.
VARIABLES: T/K = 303.15	PREPARED BY: T. Mioduski
EXPERIMENTAL VALUES: <p>The solubility of NdI₃ in H₂NCH₂CH₂OH at 30°C was given as</p> <p style="text-align: center;">1.93 g/100 solvent</p> <p>The corresponding molality calculated by the compiler is</p> <p style="text-align: center;">0.0368 mol kg⁻¹</p> <p>Solid phase composition not determined.</p>	
AUXILIARY INFORMATION	
METHOD/APPARATUS/PROCEDURE: <p>The isothermal method was used. Reaction mixtures were sealed in 25 x 200 mm test tubes and thermostated for one week at 30 ± 0.05°C with frequent agitation. The density of the supernatant liquid was determined pycnometrically (but not reported in the source paper), and the neodymium content determined by precipitating the hydrous hydroxide from a measured aliquot by adding excess water, igniting to the oxide and weighing.</p> <p>All anhydrous substances were handled in a dry box through which a current of nitrogen was passed. The nitrogen was freed of CO₂ and moisture by passage through concentrated sulfuric acid, soda lime, and Drierite. All solutions were prepared in the dry box, and were sealed before being removed.</p>	SOURCE AND PURITY OF MATERIALS: Nd ₂ O ₃ was converted to the iodide by high temperature reaction with NH ₄ I. Unreacted NH ₄ I removed by heating in N ₂ and in vacuo. The oxide labeled Nd-28 from University stocks contained traces of other rare earth metals. Ethanolamine (Carbide and Carbon Chemicals) purified as in (1). The product boiled at 168°C (uncor), had a density of 1.0108 g/ml at 26.5°C, and had an electrolytic conductivity of 1.93 x 10 ⁻⁵ S cm ⁻¹ at 20°C. It was stored under N ₂ in flasks sealed with wax.
ESTIMATED ERROR: Soly: precision probably 1% at best (compilers). Temp: precision ± 0.05 K (authors).	
REFERENCES: 1. Dirkse, T.P.; Briscoe, H.T. <i>Metal Ind.</i> <u>1938</u> , 36, 284.	

COMPONENTS: (1) Neodymium iodide; NdI ₃ ; [13813-24-6] (2) Morpholine; C ₄ H ₉ NO; [110-91-8]	ORIGINAL MEASUREMENTS: Moeller, T.; Zimmerman, P.A. <i>J. Am. Chem. Soc.</i> <u>1953</u> , 75, 3940-3.
VARIABLES: T/K = 303.15	PREPARED BY: T. Mioduski
EXPERIMENTAL VALUES: The solubility of NdI ₃ in morpholine at 30°C was given as $0.500 \text{ g/100 solvent}$ The corresponding molality calculated by the compiler is $9.52 \times 10^{-3} \text{ mol kg}^{-1}$ Solid phase composition not determined.	
AUXILIARY INFORMATION	
METHOD/APPARATUS/PROCEDURE: The isothermal method was used. Reaction mixtures were sealed in 25 x 200 mm test tubes and thermostated for one week at 30 ± 0.05°C with frequent agitation. The density of the supernatant liquid was determined pycnometrically (but not reported in the source paper), and the neodymium content determined by precipitating the hydrous hydroxide from a measured aliquot by adding excess water, igniting to the oxide and weighing. All anhydrous substances were handled in a dry box through which a current of nitrogen was passed. The nitrogen was freed of CO ₂ and moisture by passage through concentrated sulfuric acid, soda lime, and Drierite. All solutions were prepared in the dry box and were sealed before being removed.	SOURCE AND PURITY OF MATERIALS: Nd ₂ O ₃ was converted to the iodide by high temperature reaction with NH ₄ I. Unreacted NH ₄ I was removed by heating in N ₂ and then in vacuo. The oxide labeled Nd-28 from University stocks contained traces of other rare earth metals. Morpholine was purified as in (1), and had a density of 0.9863 g/ml at 27°C, and an electrolytic conductivity of 3.368 x 10 ⁻⁸ S cm ⁻¹ . The solvent was stored under nitrogen in glass stoppered flasks sealed with wax. ESTIMATED ERROR: Soly: precision probably 1% at best (compilers). Temp: precision ± 0.05 K (authors). REFERENCES: 1. Dermer, V.H.; Dermer, O.C. <i>J. Am. Chem. Soc.</i> <u>1937</u> , 59, 1148.

COMPONENTS: (1) Neodymium iodide; NdI ₃ ; [13813-24-6] (2) N,N-Dimethylformamide; C ₃ H ₇ NO; [68-12-2]	ORIGINAL MEASUREMENTS: Moeller, T.; Galasyn, V. <i>J. Inorg. Nucl. Chem.</i> <u>1960</u> , <i>12</i> , 259-65.
VARIABLES: T/K = 298.15	PREPARED BY: M. Salomon
EXPERIMENTAL VALUES: <p>The solubility of NdI₃ in HCON(CH₃)₂ at 25°C was reported as</p> 657.1 g dm^{-3} <p>and as</p> $0.5921 \text{ mol dm}^{-3}$ <p>The solid phase is the solvate NdI₃·8HCON(CH₃)₂. The melting point (sealed tube method) of this solvate given as 91.5 - 94.5°C.</p>	
AUXILIARY INFORMATION	
METHOD/APPARATUS/PROCEDURE: Authors state that solubilities were determined by analysis of aliquots after equilibration at 25 ± 0.025°C, and that techniques were generally similar to those described in (1). The rare earth content was determined by complexometric titration with EDTA at 60°C. Iodide was determined by the Volhard method, and carbon, hydrogen, and nitrogen by usual microanalytical techniques.	SOURCE AND PURITY OF MATERIALS: The initial material was the rare earth oxide of 99.9+% purity. Iodides were prepd by two methods. 1. Acetyl iodide method (2) where the hydrated acetate is treated with acetyl iodide in benzene. Acetyl iodide prepd as in (3). 2. The iodide was prepd by metathesis by reaction of the hydrated NdCl ₃ with KI in DMF followed by addition of benzene and distillation of the benzene-water azeotrope. For both preparations the solvate NdI ₃ ·8DMF was recrystallized from DMF by addition of ether. The solvent, DMF, was prepared as in (4,5), and its electrolytic conductance was $\geq 3.7 \times 10^{-7} \text{ S cm}^{-1}$ at 25°C.
REFERENCES: 1. Moeller, T.; Cullen, G.W. <i>J. Inorg. Nucl. Chem.</i> <u>1959</u> , <i>10</i> , 148. 2. Watt, G.W.; Gentile, P.S.; Helvenston, E.P. <i>J. Am. Chem. Soc.</i> <u>1955</u> , <i>77</i> , 2752. 3. Biltz, H.; Biltz, W. <i>Laboratory Methods of Inorganic Chemistry (2nd Edition)</i> . John Wiley. N.Y. <u>1928</u> . 4. Leader, G.R.; Gormley, J.F. <i>J. Am. Chem. Soc.</i> <u>1951</u> , <i>73</i> , 5731. 5. Thomas, A.B.; Rochow, E.G. <i>J. Am. Chem. Soc.</i> <u>1957</u> , <i>79</i> , 1843.	ESTIMATED ERROR: Soly: precision around ± 0.1% (compiler). Temp: precision ± 0.025 K (authors).