



Cite this: *Phys. Chem. Chem. Phys.*,  
2025, 27, 9282

## Correction: Experimental investigation and thermodynamic modelling assessment of the $\text{AECl}_2\text{-NdCl}_3$ (AE = Sr, Ba) systems

D. C. Alders, D. J. Cette, R. J. M. Konings and A. L. Smith\*

DOI: 10.1039/d5cp90070k

Correction for 'Experimental investigation and thermodynamic modelling assessment of the  $\text{AECl}_2\text{-NdCl}_3$  (AE = Sr, Ba) systems' by D. C. Alders *et al.*, *Phys. Chem. Chem. Phys.*, 2024, **26**, 24041–24057, <https://doi.org/10.1039/D4CP01784F>.

rsc.li/pccp

The reference list in the originating article was incorrect. The correct list of references is shown here.

The Royal Society of Chemistry apologises for these errors and any consequent inconvenience to authors and readers.

### References

- 1 T. Abram and S. Ion, Generation-IV nuclear power: A review of the state of science, *Energy Policy*, 2008, **36**, 4323–4330.
- 2 E. Bettis, R. Schroeder, G. Cristy, H. Savage, R. Affel and L. Hemphill, The aircraft reactor experiment—design and construction, *Nucl. Sci. Eng.*, 1957, **2**(6), 804–825.
- 3 C. Le Brun, Molten salts and nuclear energy production, *J. Nucl. Mater.*, 2007, **360**(1), 1–5.
- 4 J. W. McMurray, K. Johnson, C. Agca, B. R. Betzler, D. J. Kropaczek, T. M. Besmann, *et al.*, *Roadmap for thermal property measurements of Molten Salt Reactor systems*, ORNL/SPR-2020/1865, Oak Ridge National Lab (ORNL), Oak Ridge, TN, USA, 2021.
- 5 D. Holcomb, G. Flanagan, B. Patton, J. Gehin, R. Howard and T. Harrison, *Fast spectrum molten salt reactor options*, ORNL/TM-2011/105, Oak Ridge National Lab (ORNL), Oak Ridge, TN, USA, 2011.
- 6 M. W. Chase Jr, NIST-JANAF thermochemical tables, *J. Phys. Chem. Ref. Data, Monogr.*, 1998, **9**, 861–864.
- 7 R. J. M. Konings and A. Kovács, Thermodynamic properties of the lanthanide(III) halides, *Handbook on the physics and chemistry of rare earths*, 2003, vol. 33, pp. 147–247.
- 8 A. Le Bail, New developments in microstructure analysis *via* Rietveld refinement, *Adv. X-Ray Anal.*, 2000, **42**, 191–203.
- 9 J. Rodríguez-Carvajal, Recent advances in magnetic structure determination by neutron powder diffraction, *Phys. B*, 1993, **192**(1–2), 55–69.
- 10 O. Beneš, R. J. M. Konings, S. Wurzer, M. Sierig and A. A. Dockendorf, DSC study of the  $\text{NaNO}_3\text{-KNO}_3$  system using an innovative encapsulation technique, *Thermochim. Acta*, 2010, **509**(1–2), 62–66.
- 11 G. Höhne, H. Cammenga, W. Eysel, E. Gmelin and W. Hemminger, The temperature calibration of scanning calorimeters, *Thermochim. Acta*, 1990, **160**(1), 1–12.
- 12 G. Della Gatta, M. J. Richardson, S. M. Sarge and S. Stølen, Standards, calibration, and guidelines in microcalorimetry. Part 2. Calibration standards for differential scanning calorimetry\*(IUPAC Technical Report), *Pure Appl. Chem.*, 2006, **78**(7), 1455–1476.
- 13 H. L. Lukas, S. G. Fries, B. Sundman, *et al.*, *Computational Thermodynamics: the Calphad method*, Cambridge University Press, 2007, vol. 131.
- 14 Centre for Research in Computational Thermochemistry, FactSage 7.2, Available from: <https://www.factsage.com>.
- 15 V. P. Glushko, L. V. Gurvich, V. A. Weitz, *et al.*, *Thermodynamic properties of individual substances*, Nauka Publishing House, Moscow, 1978, vol. 3.
- 16 D. C. Alders, J. Vlieland, M. Thijs, R. J. M. Konings and A. L. Smith, Experimental investigation and thermodynamic assessment of the  $\text{BaCl}_2\text{-CeCl}_3$  system, *J. Mol. Liq.*, 2024, **396**, 123997.

Delft University of Technology, Faculty of Applied Sciences, Radiation Science & Technology Department, Mekelweg 15, 2629 JB Delft, The Netherlands.  
E-mail: a.l.smith@tudelft.nl



- 17 G. van Oudenaren, J. A. Ocadiz-Flores and A. L. Smith, Coupled structural thermodynamic modelling of the molten salt system NaCl-UCl<sub>3</sub>, *J. Mol. Liq.*, 2021, **342**, 117470.
- 18 T. Dumaire, J. A. Ocadiz-Flores, R. J. M. Konings and A. L. Smith, A promising fuel for fast neutron spectrum Molten Salt Reactor: NaCl-ThCl<sub>4</sub>-PuCl<sub>3</sub>, *Calphad*, 2022, **79**, 102496.
- 19 A. D. Pelton, P. Chartrand and G. Eriksson, The modified quasi-chemical model: Part IV. Two-sublattice quadruplet approximation, *Metall. Mater. Trans. A*, 2001, **32**(6), 1409–1416.
- 20 O. Beneš, *Thermodynamic database on molten salt reactor systems*, European Commission, Joint Research Centre, 2021.
- 21 H. T. Davis and S. A. Rice, Perturbation theory of the heats of mixing of fused salts, *J. Chem. Phys.*, 1964, **41**(1), 14–24.
- 22 S. A. Hodorowicz, M. Olejak-Chodan and H. A. Eick, A preparatory and X-ray diffraction study of the SrCl<sub>2</sub>-NdCl<sub>3</sub> system, *J. Solid State Chem.*, 1987, **71**(1), 205–213.
- 23 I. S. Morozov and F. N. T'en, Types of Equilibrium Diagram of Binary Systems of R.E.E. and Alkaline-earth Metal Chlorides, *Russ. J. Inorg. Chem.*, 1971, **16**(8), 1215–1217.
- 24 G. Vogel and A. Schneider, Chemie der seltenen erden in geschmolzenen alkalihalogeniden XII [1], *Inorg. Nucl. Chem. Lett.*, 1972, 513–521.
- 25 G. Meyer and S. Masselmann, The alkali-poor part of the pseudoternary triangle AX/BX<sub>2</sub>/MX<sub>3</sub>: crystal structures, properties, and potentials of (alkali)/alkaline-earth/rare-earth chloride materials, *Chem. Mater.*, 1998, **10**(10), 2994–3004.
- 26 C. Bjorklund, J. Reavis, J. Leary and K. Walsh, Phase equilibria in the binary systems PuCl<sub>3</sub>-NaCl and PuCl<sub>3</sub>-LiCl, *J. Phys. Chem.*, 1959, **63**(10), 1774–1777.
- 27 O. Beneš and R. J. M. Konings, Thermodynamic evaluation of the NaCl-MgCl<sub>2</sub>-UCl<sub>3</sub>-PuCl<sub>3</sub> system, *J. Nucl. Mater.*, 2008, **375**(2), 202–208.
- 28 J. Yingling, J. Schorne-Pinto, M. Aziziha, J. Ard, A. Mofrad and M. Christian, *et al.*, Thermodynamic measurements and assessments for LiCl-NaCl-KCl-UCl<sub>3</sub> systems, *J. Chem. Thermodyn.*, 2023, **179**, 106974.
- 29 R. D. Shannon, Revised effective ionic radii and systematic studies of in interatomic distances in halides and chalcogenides, *Acta Crystallogr., Sect. A*, 1976, **32**(5), 751–767.
- 30 K. W. Johnson, M. Kahn and J. Leary, Phase Equilibria in Fused Salt Systems: Binary Systems of Plutonium(III) Chloride with the Chlorides of Magnesium, Calcium, Strontium and Barium, *J. Phys. Chem.*, 1961, **65**(12), 2226–2229.
- 31 M. Taube, *Fast reactors using molten chloride salts as fuel. Technical report*, INFCE, Switzerland, 1978.
- 32 A. Dworkin and M. Bredig, The heats of fusion and transition of alkaline earth and rare earth metal halides, *J. Phys. Chem.*, 1963, **67**(3), 697–698.
- 33 P. Chartrand and A. D. Pelton, Thermodynamic evaluation and optimization of the LiCl-NaCl-KCl-RbCl-CsCl-MgCl<sub>2</sub>-CaCl<sub>2</sub>-SrCl<sub>2</sub>-BaCl<sub>2</sub> system using the modified quasichemical model, *Can. Metall. Q.*, 2001, **40**(1), 13–32.
- 34 R. A. Sharma and R. A. Rogers, Phase Equilibria and Structural Species in NdCl<sub>3</sub>-NaCl, NdCl<sub>3</sub>-CaCl<sub>2</sub>, PrCl<sub>3</sub>-NaCl, and PrCl<sub>3</sub>-CaCl<sub>2</sub> Systems, *J. Am. Ceram. Soc.*, 1992, **75**(9), 2484–2490.
- 35 K. Igarashi, M. Kosaka, Y. Iwadate, T. Hattori and J. Mochinaga, Phase Diagrams of LiCl-NdCl<sub>3</sub>, NaCl-NdCl<sub>3</sub>, and CaCl<sub>2</sub>-NdCl<sub>3</sub> Systems, *Denki Kagaku Oyobi Kogyo Butsuri Kagaku*, 1990, **58**(5), 469–470.
- 36 M. Gaune-Escard, A. Bogacz, L. Rycerz and W. Szczepaniak, Calorimetric investigation of NdCl<sub>3</sub>-MCl liquid mixtures (where M is Na, K, Rb, Cs), *Thermochim. Acta*, 1994, **236**, 67–80.
- 37 E. Vortisch, *Neues Jahrb Mineral Geol.*, 1914, **38**, 202–220.
- 38 K. Scholich, *Neues Jahrb Mineral Geol.*, 1920, **43**, 269.
- 39 G. A. Bukhalova, *Izv. Sekt. Fiz.-Khim. Anal.*, 1955, **26**, 138.
- 40 T. Østvold, *A thermodynamic study of some fused salt mixtures containing alkali and alkaline earth chlorides, bromides and iodides*, Institute of Physical Chemistry, University of Trondheim, NTH, 1971, vol. 91.
- 41 H. Gemskey, *Neues Jahrb Mineral Geol. Paleontol. Beil.*, 1913, **36**, 513.
- 42 M. Zakharchenko and S. Aslanov, The ternary system containing the chlorides of lithium, sodium and barium, *Zh. Neorgan. Khim.*, 1963, **8**, 1532–1534.

