Solubility Data Are Compiled for Metals in Liquid Zinc

The problem:
To present existing data on the solubility of metals in liquid zinc in a more useful and convenient form. The solubility data for metals in such solvents as zinc are important for process development, corrosion studies, and theoretical studies of liquid-metal solutions.

The solution:
Available data on the solubilities of various metals in liquid zinc have been compiled into an up-to-date report. The temperature dependence of the solubility data is expressed using the empirical straight line relationship which exists between the logarithm of the solubility and the reciprocal of the absolute temperature.

How it's done:
The solubility of a metallic solute in liquid zinc, defined as the weight or atomic percent of the solute in the liquid zinc-rich phase in equilibrium with a solid phase, is presented in three forms:
1. Tabular form of both the original and smoothed data.
2. Graphs of original data, with a least-squares line drawn through the points.
3. Equations for the solubility as a function of temperature (based on least-squares line)

Solubility data and, when known, the composition of the equilibrium solid phase on the following zinc binary alloy systems are reported (alphabetical by chemical symbol):
- silver-zinc
- aluminum-zinc
- gold-zinc
- cadmium-zinc
- cerium-zinc
- cobalt-zinc
- chromium-zinc
- copper-zinc
- iron-zinc
- gallium-zinc
- germanium-zinc
- indium-zinc
- lanthanum-zinc
- lithium-zinc
- magnesium-zinc
- magnesium-zinc
- molybdenum-zinc
- sodium-zinc
- niobium-zinc
- neodymium-zinc
- nickel-zinc
- arsenic-zinc
- bismuth-zinc
- calcium-zinc
- lead-zinc
- palladium-zinc
- praseodymium-zinc
- platinum-zinc
- plutonium-zinc
- rhodium-zinc
- ruthenium-zinc
- antimony-zinc
- silicon-zinc
- tin-zinc
- strontium-zinc
- technetium-zinc
- thorium-zinc
- titanium-zinc
- uranium-zinc
- vanadium-zinc
- yttrium-zinc
- zirconium-zinc

Notes:
1. The information may be helpful in determining the feasibility of using liquid zinc as a solvent in a reactor fuel decontamination process.
2. It should be of interest to persons concerned with processes where liquid zinc is in contact with another metal, such as in soldering applications employing solders of a high zinc content.
3. Additional details are contained in The Solubility of Metals in Liquid Zinc by Irving Johnson and Ira G. Dillon, November 1965, ANL-7083 available from the Clearinghouse for Scientific and Technical Information, Springfield, Virginia 22151, price $3.00 each (microfiche copies $0.65 each).

(continued overleaf)
4. Inquiries concerning this innovation may be directed to:
Office of Industrial Cooperation
Argonne National Laboratory
9700 South Cass Avenue
Argonne, Illinois 60439
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Source: I. Johnson and I. G. Dillon
Chemical Engineering Division
(ARG-149)

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Inquiries about obtaining rights for commercial use of this innovation may be made to:
Mr. George H. Lee, Chief
Chicago Patent Group
U.S. Atomic Energy Commission
Chicago Operations Office
9800 South Cass Avenue
Argonne, Illinois 60439