

Mound Laboratory, Miamisburg, Ohio

November 3, 1955

MOUND LABORATORY-MONSANTO  
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Dr. J. F. Eichelberger

Research Div.

Trip Report to Oak Ridge National  
Laboratory by B. C. Blanke

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Barton, Insley, McVey, Thoma, Tucker, Rhinehammer

A six hour discussion was held on the ternary, sodium fluoride, beryllium fluoride, and uranium fluoride. Barton suggested that in our studies, we use compounds as  $\text{NaBeF}_3$  rather than individual salts as  $\text{NaF}$  as starting materials, and that they might supply small amounts of these compounds. Also, the loss of beryllium fluoride by volatilization should be very small in solutions of less than 50 mole per cent beryllium fluoride. Thoma suggested that a probable explanation for this apparent loss is that a beryllium fluoride glass forms due to the affinity of uranium for the sodium salt, giving an apparent shift of compositions away from the beryllium content. The glass would not be detected by X-Ray or petrography.

The four phases found present in several low beryllium mixtures were due to non-equilibrium cooling. One, and perhaps two, incongruent melting compounds may form on the  $\text{UF}_4 - \text{Na}_2\text{BeF}_4$  join. A suggested procedure for checking would be to completely melt a mixture of approximate composition and quench it. Then raise the temperature to a temperature just below  $560^\circ\text{C}$  for 48 hours and requench.

Thoma suggested a DTA study over the region 36 - 60 mole percent sodium fluoride for breaks to eliminate the possibility of temporary solid solution.

Mention was made of a desire to get Francis Joy's work published as a note, if not as a full paper. Much of ORNL's later work is based on this work, and they would like to publish, but feel his should get first recognition.

Thoma, Rhinehammer

Inspection of X-ray fluoroscopic equipment used for determination of light element fluorides in the presence of uranium fluoride. (G. E. XRD 4 with Norelco head and linear recorder). Techniques and methods of preparation of samples were also covered. Their technique has been very helpful to their analytical group.

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Paul Kofmehl

Requests information on our mechanical dejacketing device used on the still project. He would like report numbers and any pertinent details.

Fletcher Moore, Lerroy Jones

Discussion of complexing action of various agents on the Pa system with particular reference to presence of phosphates and iron. Attention was given to ORNL separation of Pa from fission products using 6 M HCl in 4% oxalic acid solution with TTA complex and H<sub>2</sub>O<sub>2</sub> stripping.

Malcolm Dole, Blankenship and Co-workers  
Barton, Grimes, Blankenship and Co-workers, L. V. Jones

A discussion of methods and results of viscosity and density measurements on the ternary was twice made before interested groups. Comparisons were made with results obtained from Poppendiek's group on the same materials showing a maximum discrepancy of 16% and most results agreeing to 3 - 5%. Our results show consistently lower values for viscosity.

Completely opposite results were obtained in observation of wetting of nickel and nickel alloys by fused fluoride mixtures by ORNL from our experience. They claim that polished surfaces are not wetted, while roughened or oxidized surfaces are wetted. Preliminary studies by some simple method of attack would be appreciated by them if time and equipment could be found. Some interest was shown in surface energy study possibilities.

Barton

Discussion was held about future studies on the ternary NaF - LiF - BeF<sub>2</sub>. A few preliminary runs have been made on OR material. They will supply some additional material in fairly large (Kg) quantity. Their area of interest is near the mixture C 78 (56 NaF, 16 LiF, 28 BeF<sub>2</sub>) in range of greater LiF concentrations (20 - 25 M%)

Barton will expedite shipment of 10 Kg UF<sub>4</sub> which we have requisitioned.

B. C. Blanke

BCB:msw

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