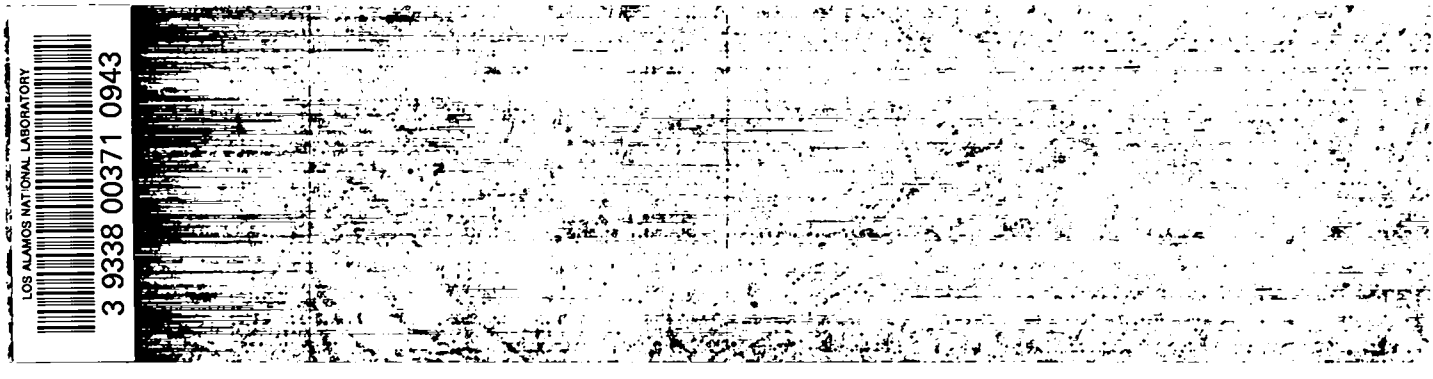
LOS ALAMOS SCIENTIFIC LABORATORY
OF THE UNIVERSITY OF CALIFORNIA o LOS ALAMOS NEW MEXICO

TEMPERATURE-COMPOSITION DIAGRAMS OF PSEUDO-BINARY SYSTEMS CONTAINING PLUTONIUM(III) HALIDES



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OF THE UNIVERSITY OF CALIFORNIA LOS ALAMOS NEW MEXICO

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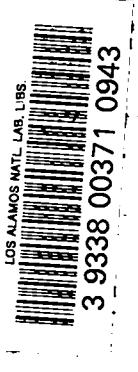
Compiled by

J. A. Leary



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ABSTRACT

Temperature composition diagrams are presented for the systems PuF_3-LiF, PuF_3-NaF, $PuCl_3$-LiCl, $PuCl_3$-NaCl, $PuCl_3$-KCl, $PuCl_3$-RbCl, $PuCl_3$-CsCl, $PuCl_3$-$MgCl_2$, $PuCl_3$-$CaCl_2$, $PuCl_3$-$SrCl_2$, and $PuCl_3$-$BaCl_2$.

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FOREWORD

The following temperature-composition diagrams were constructed from the literature cited in the references. The two plutonium(III) fluoride diagrams were reported in The Journal of Inorganic and Nuclear Chemistry by workers at Oak Ridge National Laboratory, and are included in this compilation with the permission of the authors. All of the plutonium(III) chloride diagrams have been reported in the Journal of Physical Chemistry by workers at Los Alamos Scientific Laboratory. The diagrams have been compiled in this report for convenient reference.

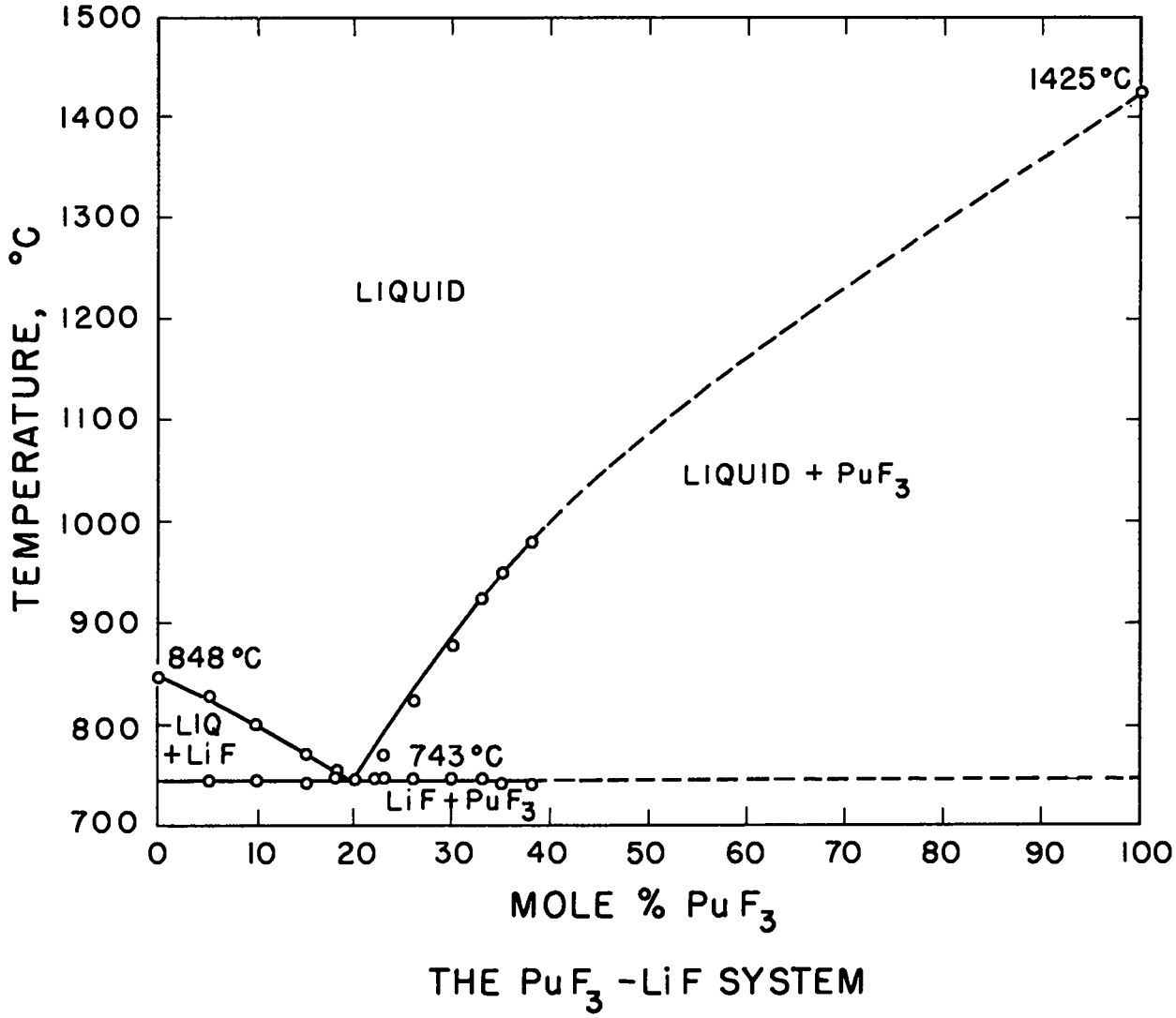

Fig. 1 (reference 1)
Eutectic point at 743°, 19.5 percent PuF_3
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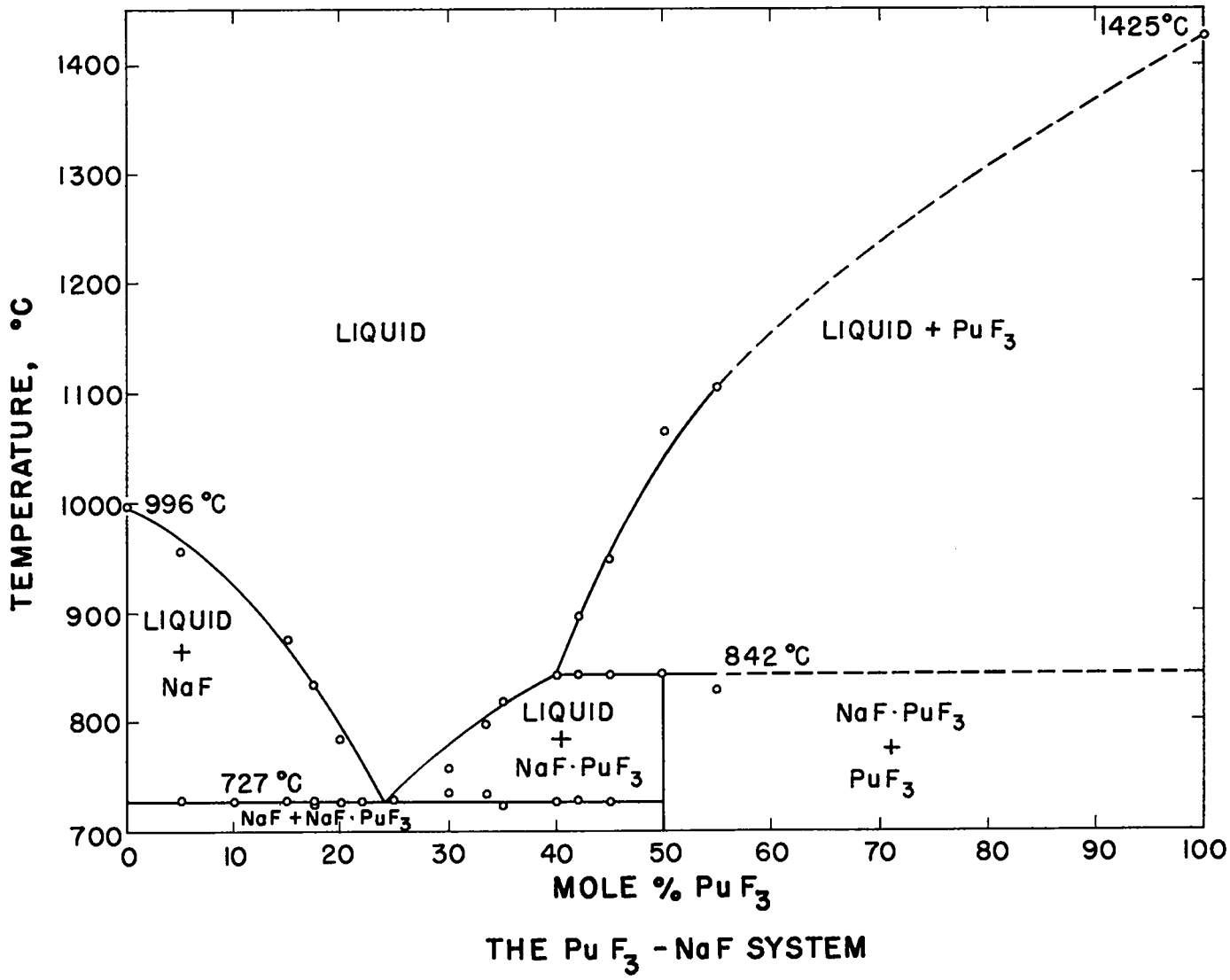

Fig. 2 (reference 2)
Eutectic point at 727°, 24 percent PuF_3
Peritectic point at 842°, 40 percent PuF_3
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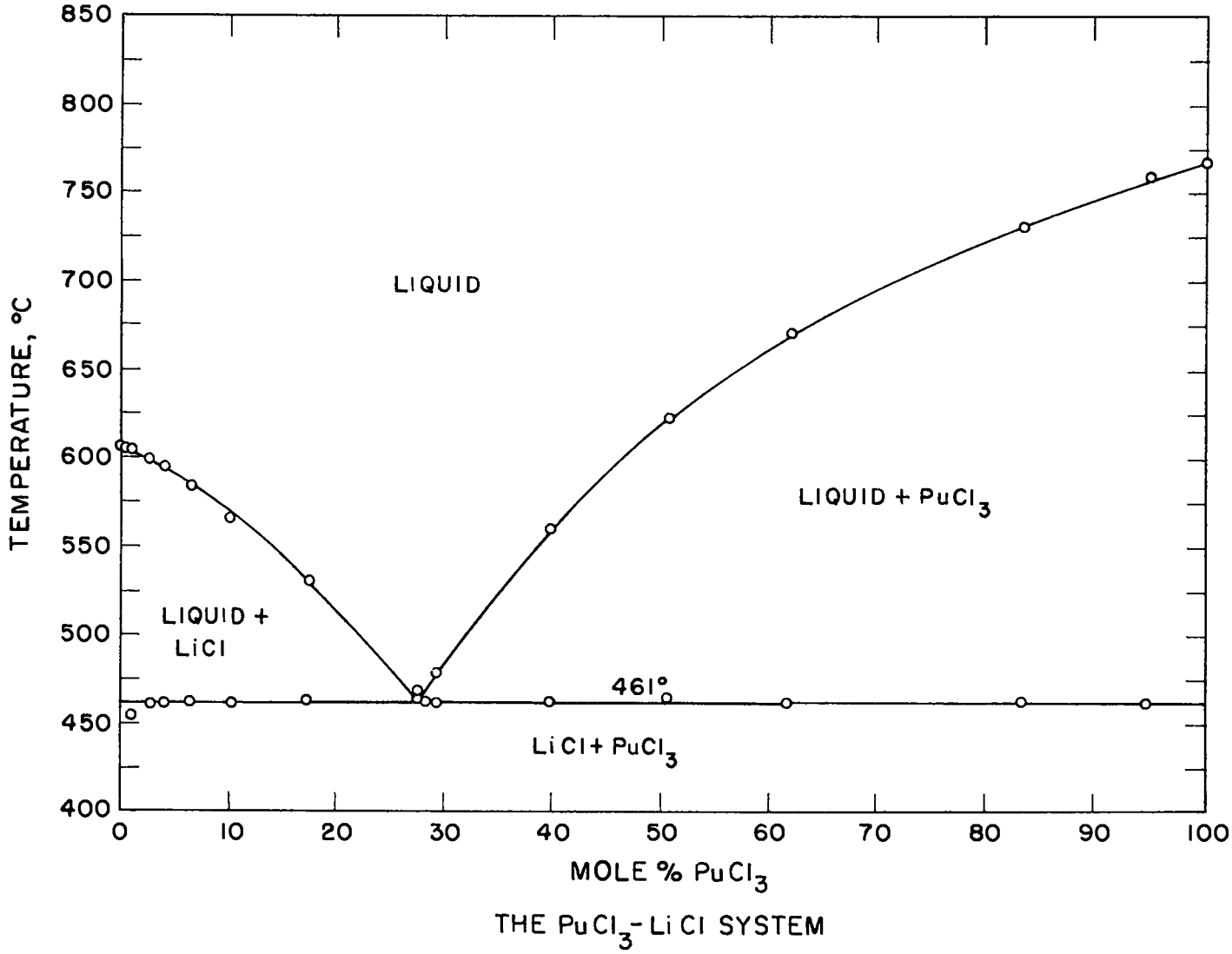

Fig. 3 (reference 3)
Eutectic point at 461°, 28 percent $PuCl_3$
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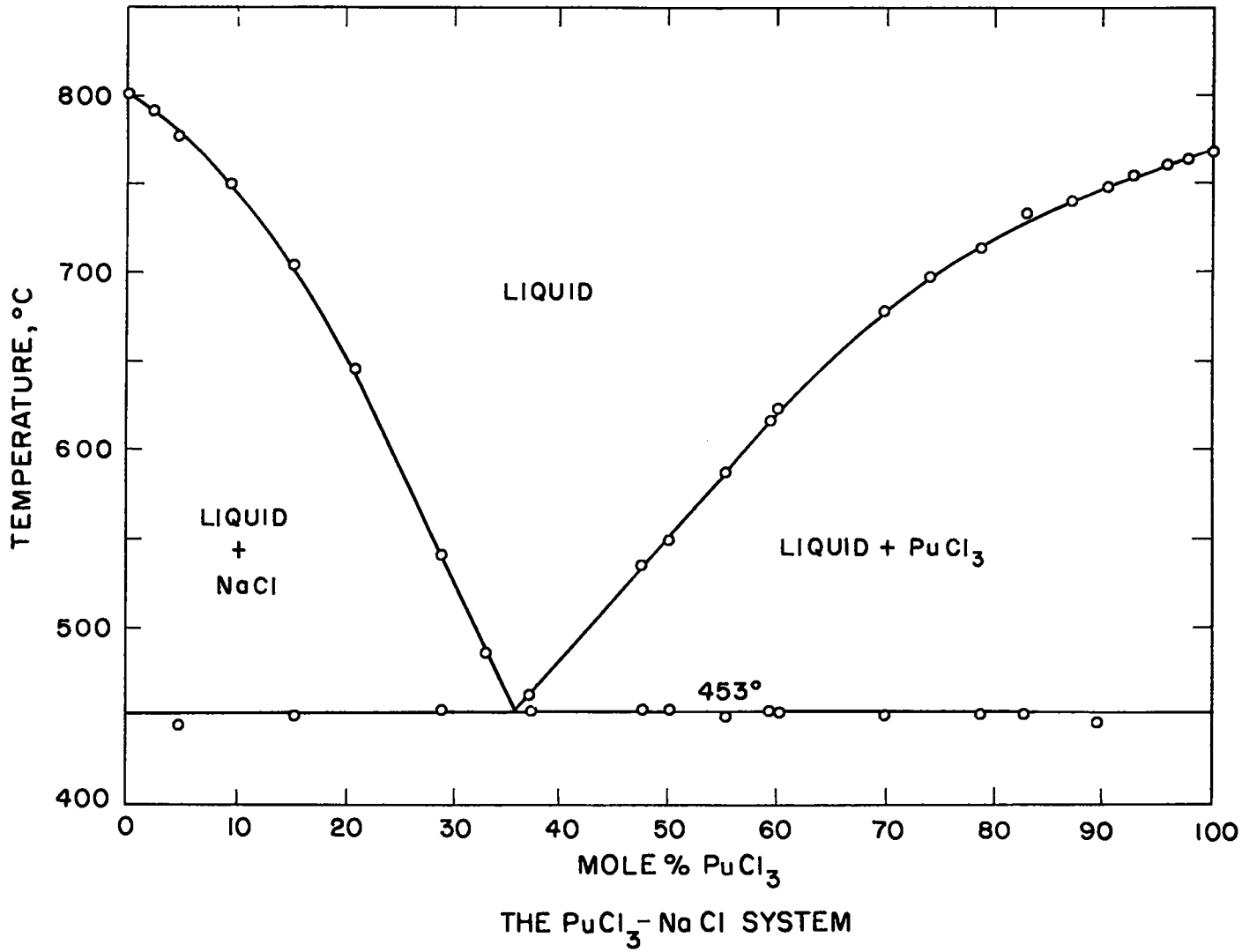

Fig. 4 (reference 3)
Eutectic point at 453°, 36 percent $PuCl_3$
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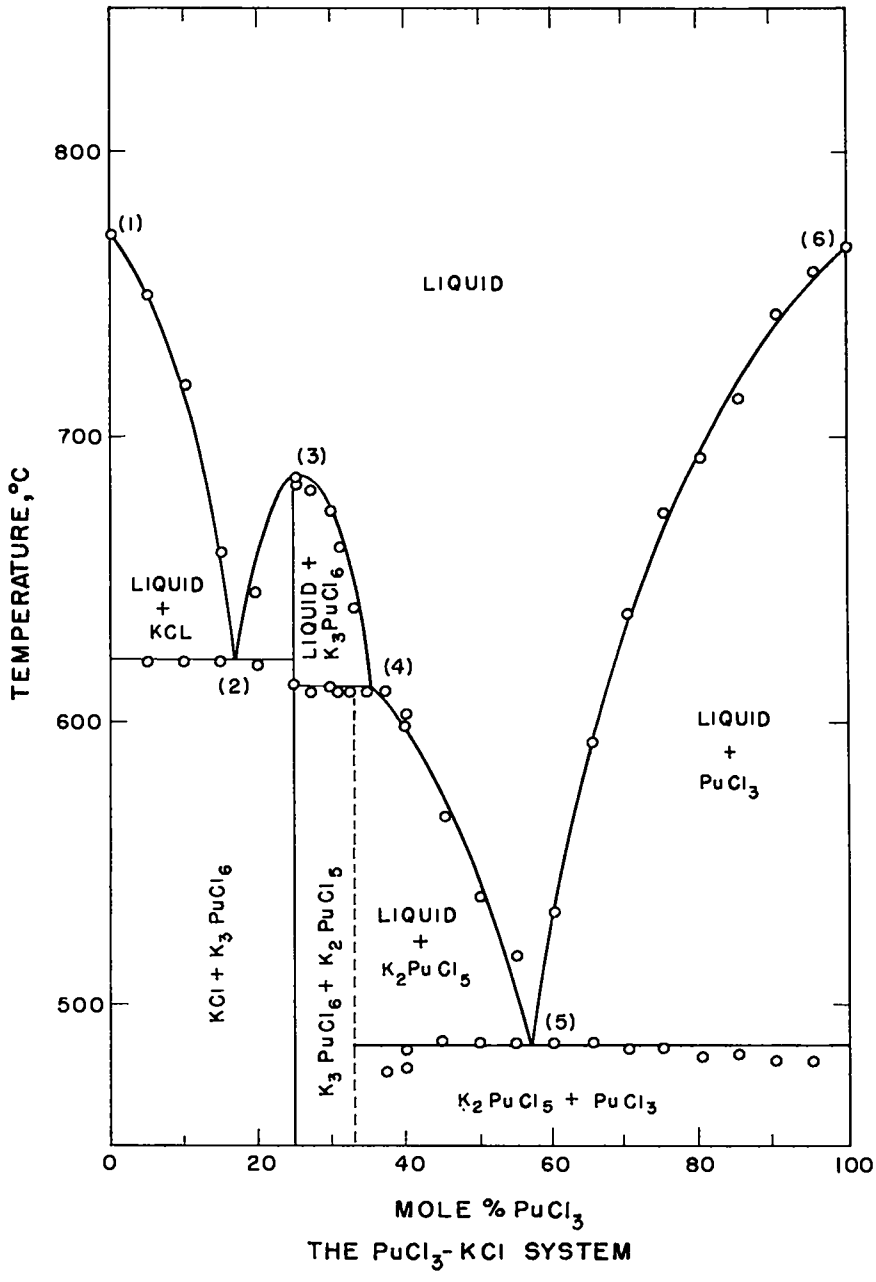

Fig. 5 (reference 4)

(1) KCl melting point, 771°
(2) Eutectic point at 621°, 17 percent $PuCl_3$
(3) K_3PuCl_6 melting point, 685°
(4) Peritectic point at 611°, 35 percent $PuCl_3$
(5) Eutectic point at 486°, 57 percent $PuCl_3$
(6) $PuCl_3$ melting point, 769°

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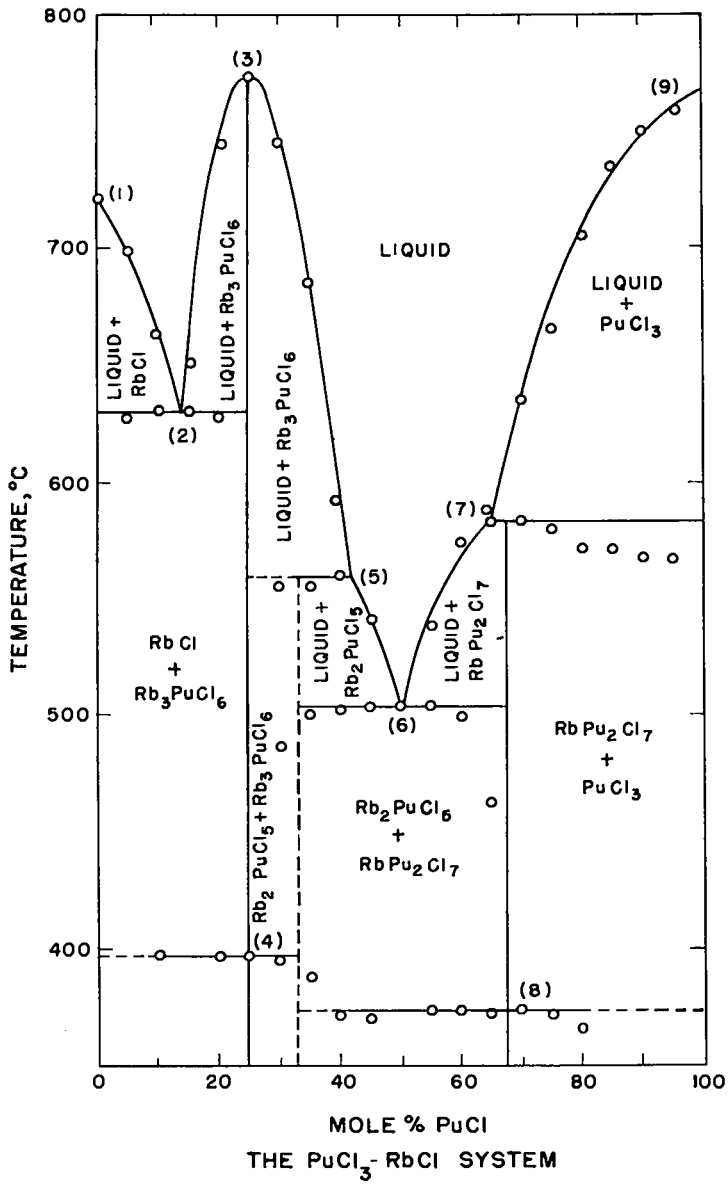

THE $PuCl_3$-RbCl SYSTEM

Fig. 6 (reference 5)

(1) RbCl melting point, 721°
(2) Eutectic point at 630°, 14 percent $PuCl_3$
(3) Rb_3PuCl_6 melting point, 774°
(4) Rb_3PuCl_6 polymorphic transformation, 398°
(5) Peritectic point at 560°, 42 percent $PuCl_3$
(6) Eutectic point at 504°, 50 percent $PuCl_3$
(7) Peritectic point at 584°, 64 percent $PuCl_3$
(8) $RbPu_2Cl_7$ polymorphic transformation, 374°
(9) $PuCl_3$ melting point, 769°

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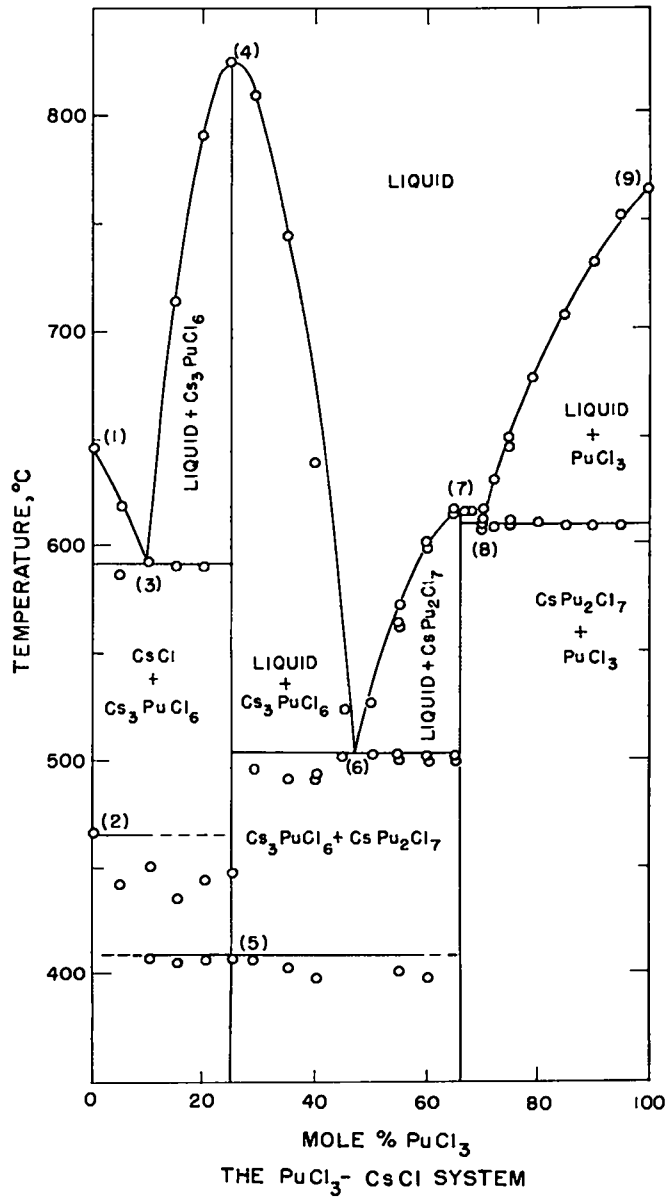

Fig. 7 (reference 5)

(1) CsCl melting point, 645°
(2) CsCl polymorphic transformation, 465°
(3) Eutectic point at 592°, 10 percent $PuCl_3$
(4) Cs_3PuCl_6 melting point, 825°
(5) Cs_3PuCl_6 polymorphic transformation, 410°
(6) Eutectic point at 504°, 47 percent $PuCl_3$
(7) $CsPu_2Cl_7$ melting point, 616°
(8) Eutectic point at 611°, 70 percent $PuCl_3$
(9) $PuCl_3$ melting point, 769°

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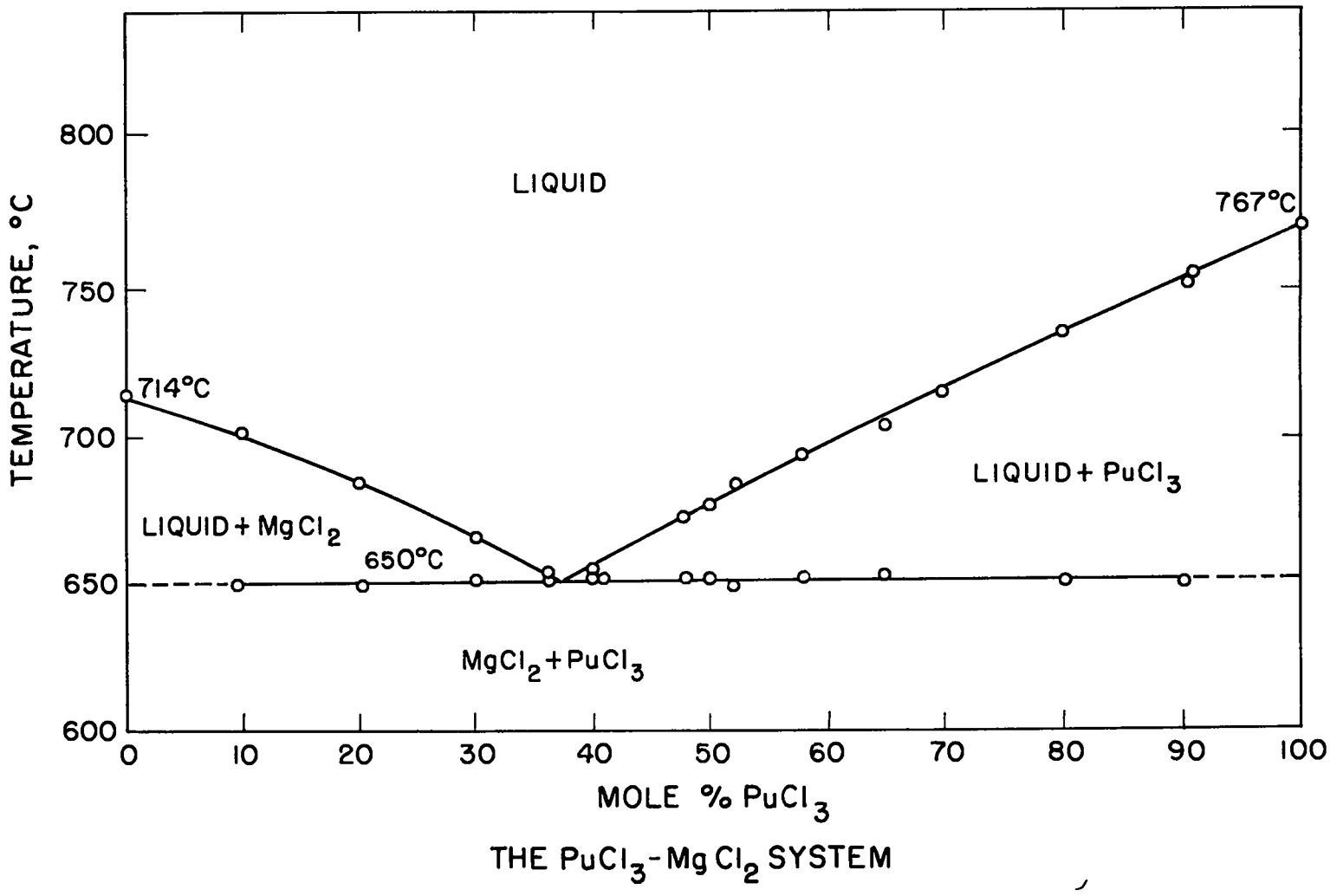

Fig. 8 (reference 6)
Eutectic point at 650°, 38 percent $PuCl_3$
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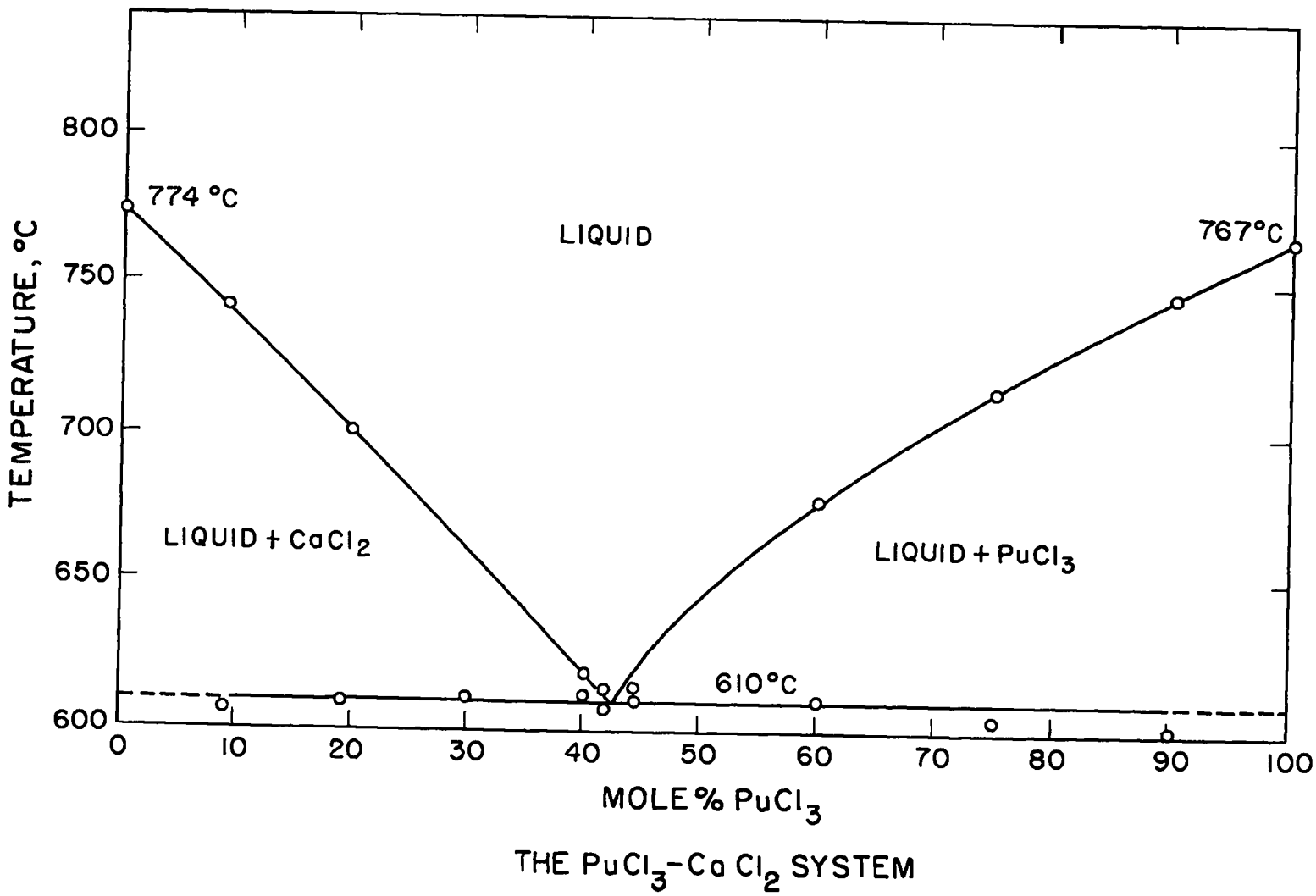

Fig. 9 (reference 6)
Eutectic point at 610°, 43 percent $PuCl_3$
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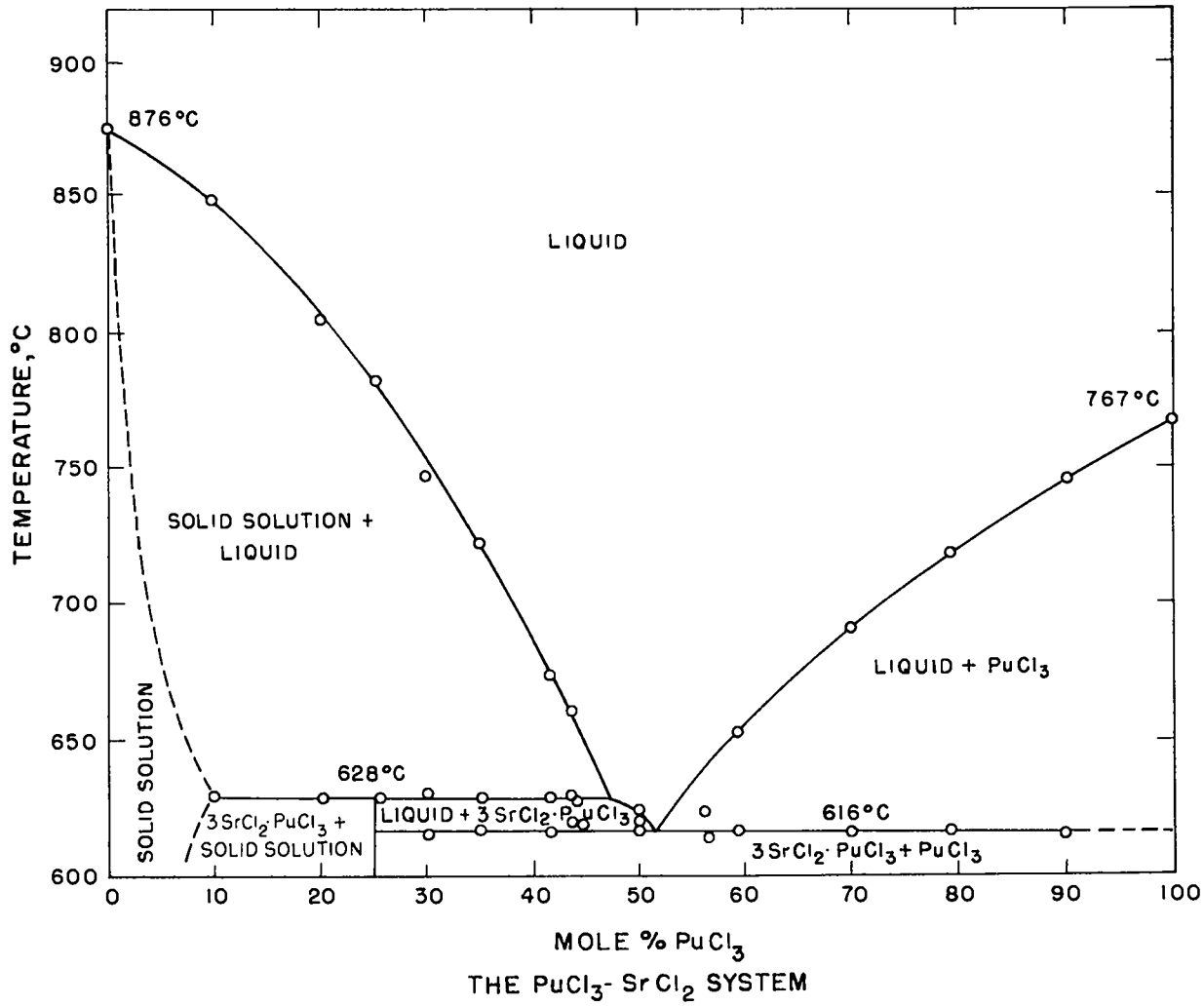

Fig. 10 (reference 6)
Peritectic point at 628°, 47 percent $PuCl_3$
Eutectic point at 616°, 52 percent $PuCl_3$
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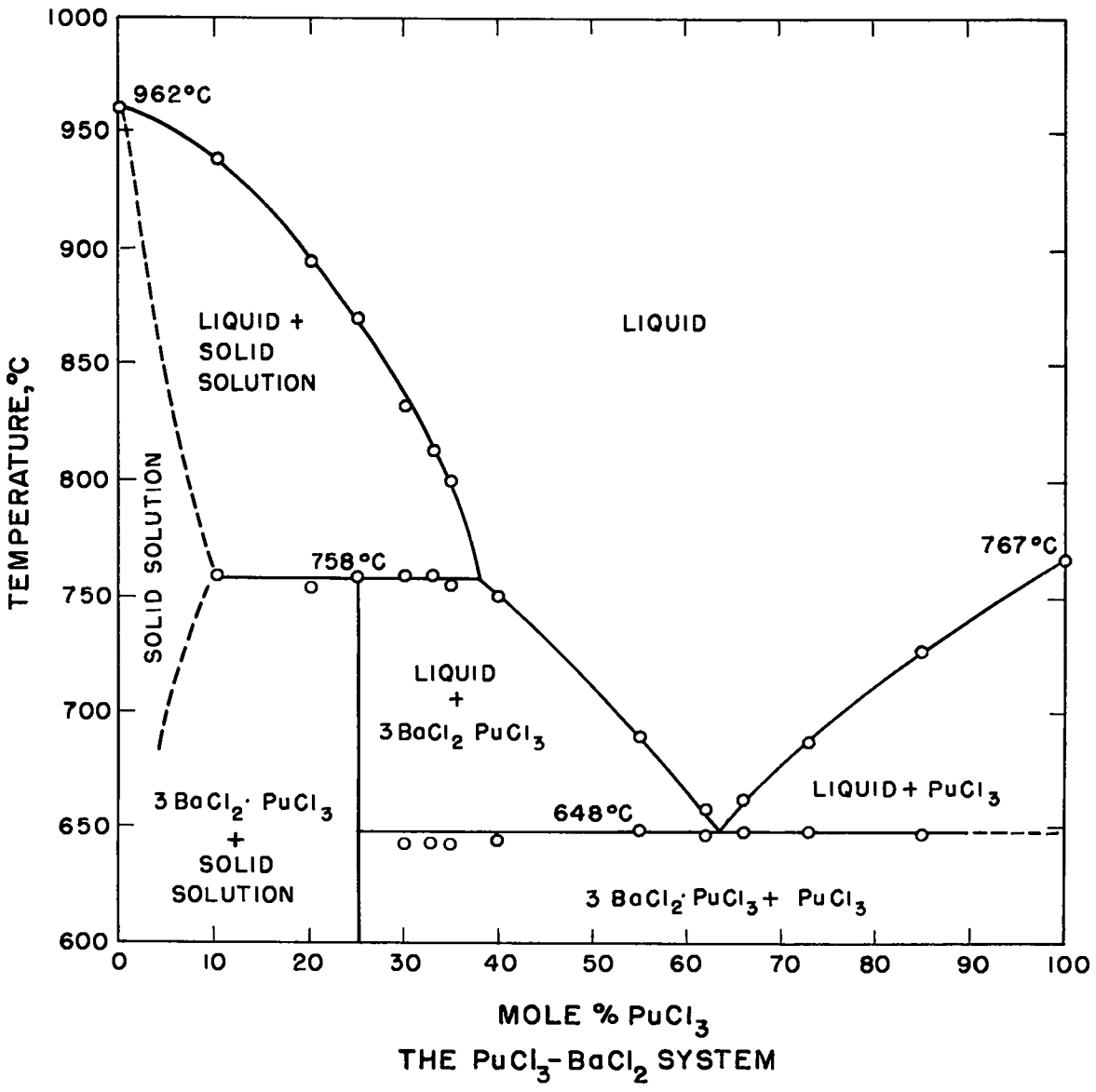

Fig. 11 (reference 6)
Peritectic point at 758°, 38 percent $PuCl_3$
Eutectic point at 648°, 64 percent $PuCl_3$
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