Ри $И_х$

Ри $И_х$ $Ме_у$ ионами

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53828j Magnetic, transport, and nuclear-magnetic-resonance properties of uranium-plutonium-aluminum ($U_{1-x}Pu_xAl_2$). Arko, A. J.; Fradin, F. Y.; Brodsky, M. B. (Argonne Natl. Lab., Argonne, Ill.). *Phys. Rev. B* 1973, 8(9), 4104-18 (Engl). Magnetic susceptibility, elec. resistivity, and ^{27}Al Knight shift and spin-lattice relaxation results on the pseudobinary cubic Laves phase compds. $U_{1-x}Pu_xAl_2$ are presented. Samples in the annealed and in the self-irradn.-damaged state were studied. The results are consistent with spin fluctuations of the 5f electron state assocd. with the actinide ions. The strength of the coupling between the s-wave conduction electrons at the Fermi energy and the 5f state increases rapidly with Pu concn. In at. well ordered $PuAl_2$ the coherence of the s-f hybridization is destroyed by spin-fluctuation scattering above 10°K. The 5f states behave as incoherent virtual bound states centered at the Fermi level in damaged $PuAl_2$ and the Pu-rich alloys. Antiferromagnetic order is found at 6°K for $U_{0.2}Pu_{0.8}Al_2$.

C.A. 1974. 80. N10

U-Pu

Pu-Zn

U-Zn

1980

93: 211013q Theoretical and experimental study of t[he] uranium-plutonium-zinc system. Smith, L. A.; Thornton, [J.] A.; Stafford, C. F.; Storton, J. M.; Holaday, V. D.; Kaufman, Larry (Babcock and Wilcox, Lynchburg, VA 24502 USA). *CALPHAD: Comput. Coupling Phase Diagrams Thermochem.* 1980, 4(3), 201-18 (Eng). A method for analyzing binary phase diagrams developed by L. Brewer (1978) for a desk top calculator is applied to detg. lattice stability and excess free energy parameters for the U-Pu, Pu-Zn, and U-Zn binary systems. These data were used to calc. a ternary phase diagram at 1273 K. Several exptl. U-Pu-Zn melts were prepd. The results of the computer generated phase diagrams prepd. with the calculator generated parameters and with regular soln. theory consts. are compared with each other and with the exptl. data. The desk top calculator program provides a valuable method for the anal. of binary phase systems. The computer generated phase diagram was valuable in guiding experimentation and in interpreting the results.

(+2)

C.A. 1980. 93 n 22

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U-Pu-Zr

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PuUx

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23 Б3054. **Термодинамическое моделирование фазовых равновесий системы плутоний—уран.** Thermodynamic modeling of the phase equilibria of the plutonium—uranium system / Leibowitz L., Blomquist R. A., Pelton A. D. // J. Nucl. Mater.— 1991.— 184, № 1.— С. 59—64.— Англ.

Проведен термодинамич. расчет фазовых равновесий в системе U—Pu. Представлена фазовая диаграмма системы, к-рая имеет существенные отличия от лит. данных в области солидуса за счет иного значения энтальпии плавления урана.

Л. Г. Титов

Х.1991, N23

Pu-U

1994

122: 17894e **Investigation of the Pu-U phase diagram.** Okamoto, Yoshihiro; Maeda, Atsushi; Suzuki, Yasufumi; Ohmichi, Toshihiko (Japan Atomic Energy Research Institute, Tokai-mura, Naka-gun, Ibaraki-ken, Japan 319-11). *J. Alloys Compd.* **1994**, 213/214, 372-4 (Eng). The Pu-U phase diagram was investigated by DTA. The transition temps. for solid phases were consistent with the widely accepted diagrams. However, a very narrow solidus-liquidus gap was found in the present work. The obtained data for the solidus and liquidus temps. were well reproduced in the thermodn. anal.

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C.A. 1995, 122, N 2

F: Pu-U
P: 1

2000

132:228101 Thermodynamic assessment of the Pu-U, Pu-Zr, and Pu-U-Zr syste Kurata, Masaki Central Research Institute of Electric Power Industry Komae 201-8511, Japan CALPHAD: Comput. Coupling Phase Diagrams Thermochem., Volume Date 1999, 23(3-4), 305-337 (English) 2000 Based on thermodn. and phase diagram data, the Gibbs energies of mixing of the soln. phases in the Pu-U and Pu-Zr systems were calcd. using an optimization procedure. The use of thermodn. data in the optimization ma it possible to accurately calc. thermodn. properties as well as the phase diagrams, which were in good agreement with the resp. exptl. values. The U-Zr ternary isotherms were calcd. by using the optimized parameters of t three binary subsystems. The results agreed reasonably well with the exp ones.

plutonium uranium zirconium binary ternary system phase equil therm

C.A. 2000, 132

F: Pu-Zr -4

P: 1

2000

132:228101 Thermodynamic assessment of the Pu-U, Pu-Zr, and Pu-U-Zr system Kurata, Masaki Central Research Institute of Electric Power Industry Komae 201-8511, Japan CALPHAD: Comput. Coupling Phase Diagrams Thermochem., Volume Date 1999, 23(3-4), 305-337 (English) 2000 Based on thermodn. and phase diagram data, the Gibbs energies of mixing o the soln. phases in the Pu-U and Pu-Zr systems were calcd. using an optim procedure. The use of thermodn. data in the optimization made it possibl accurately calc. thermodn. properties as well as the phase diagrams, whic in good agreement with the resp. exptl. values. The Pu-U-Zr ternary isot were calcd. by using the optimized parameters of the three binary subsyst The results agreed reasonably well with the exptl. ones.

C.A. 2000, 132

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P: ~~1~~

2000

132:228101 Thermodynamic assessment of the Pu-U, Pu-Zr, and Pu-U-Zr syste Kurata, Masaki Central Research Institute of Electric Power Industry Komae 201-8511, Japan CALPHAD: Comput. Coupling Phase Diagrams Thermochem., Volume Date 1999, 23(3-4), 305-337 (English) 2000 Based on thermodn. and phase diagram data, the Gibbs energies of mixing of the soln. phases in the Pu-U and Pu-Zr systems were calcd. using an optimization procedure. The use of thermodn. data in the optimization ma it possible to accurately calc. thermodn. properties as well as the phase diagrams, which were in good agreement with the resp. exptl. values. The U-Zr ternary isotherms were calcd. by using the optimized parameters of t three binary subsystems. The results agreed reasonably well with the exp ones.

plutonium uranium zirconium binary ternary system phase equil therm

C.A. 2000, 132

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C.A 2000, 132

the phase diagrams, which were in good agreement with the resp. exptl. values. The U-Zr ternary isotherms were calcd. by using the optimized parameters of t three binary subsystems. The results agreed reasonably well with the exp ones.

plutonium uranium zirconium binary ternary system phase equil therm

F: Pu-U-Zr
P: 1

2000

132:228101 Thermodynamic assessment of the Pu-U, Pu-Zr, and Pu-U-Zr system. Kurata, Masaki.
Central Research Institute of Electric Power Industry Komae 201-8511, Japan CALPHAD: Comput. Coupling Phase Diagrams Thermochem., Volume Date 1999, 23(3-4), 305-337 (English) 2000 Based on thermodn. and phase diagram data, the Gibbs energies of mixing o the soln. phases in the Pu-U and Pu-Zr systems were calcd. using an optim procedure. The use of thermodn. data in the optimization made it possibl accurately calc. thermodn. properties as well as the phase diagrams, whic in good agreement with the resp. exptl. values. The Pu-U-Zr ternary isot were calcd. by using the optimized parameters of the three binary subsyst The results agreed reasonably well with the exptl. ones.

2000

F: Pu-U
P: 1
132:228101 Thermodynamic assessment of the Pu-U, Pu-Zr, and Pu-U-Zr system. Kurata, Masaki. Central Research Institute of Electric Power Industry Komae 201-8511, Japan CALPHAD: Comput. Coupling Phase Diagrams Thermochem., Volume Date 1999, 23(3-4), 305-337 (English) 2000 Based on thermodn. and phase diagram data, the Gibbs energies of mixing o the soln. phases in the Pu-U and Pu-Zr systems were calcd. using an optim procedure. The use of thermodn. data in the optimization made it possibl accurately calc. thermodn. properties as well as the phase diagrams, whic in good agreement with the resp. exptl. values. The Pu-U-Zr ternary isot were calcd. by using the optimized parameters of the three binary subsyst The results agreed reasonably well with the exptl. ones.

C.A. 2000, 132.

F: U-Pu-Zr-Fe
P: 1

2001

135:22970 **Thermodynamic evaluation of the quaternary U-Pu-Zr-Fe system. Assessment of cladding temperature limits of metallic fuel in a fast reactor.** Kurata, Masaki; Nakamura, Kinya; Ogata, Takanari. Central Research Institute of Electric Power Industry, Komae, Japan. J. Nucl. Mater. (2001), 294(1,2), 123-129 in English.

The quaternary U-Pu-Zr-Fe system was assessed using thermodn. and phase diagram data in order to evaluate fuel-cladding chem. interactions (FCCI) of metallic fuel in a fast reactor. The Gibbs energy of mixing for soln. phases and the Gibbs energy of formation of compds. in the binary sub-systems were calcd. using an optimization procedure. The use of such data in optimizing the binary sub-systems enabled appropriate calcns. for the thermodn. properties of the systems, which were also important when extrapolating to higher-order systems. Isotherms of ternary sub-systems were calcd. by using the optimized parameters of the binary subsystems. Based on the phase relation data measured in regions of the ternary systems, the isotherms were then modified by adding ternary interaction parameters. The calcn. results agreed well with the exptl. data points. Finally, the quaternary system was assessed. The phase relationship obsd. exptl. in the diffusion couple of U-Pu-Zr-Fe was in reasonable agreement with the calcd. phase diagrams.

Fe-Pu-U

2001

135: 110413a **Phase relations in the Fe–Pu–U ternary system.** Nakamura, Kinya; Kurata, Masaki; Ogata, Takanari; Yokoo, Takeshi; Mignanelli, Michael A. (Central Research Institute of Electric Power Industry, Tokyo, Japan 201–8511). *J. Phase Equilib.* **2001**, 22(3), 259–264 (Eng), ASM International. An isothermal section of the Fe–Pu–U ternary system at 650°C was assessed in a previous study. In the present study, the predictions of the phase relations in the Fe–Pu–U system to higher and lower temps. were performed by applying the interaction parameters detd. at 650°C. DTA for the Fe–Pu–U alloys was also carried out to confirm the phase relations in the temp. region of 500 to 800°C. Both results agreed well. On the basis of the predicted ternary phase diagram, the phase relations for a region surrounded by Fe_2Pu, Fe_2U, U, and Pu were described by a reaction scheme and a projection of the liquidus surface.

термод. систем

C.A. 2001, 135, N8.