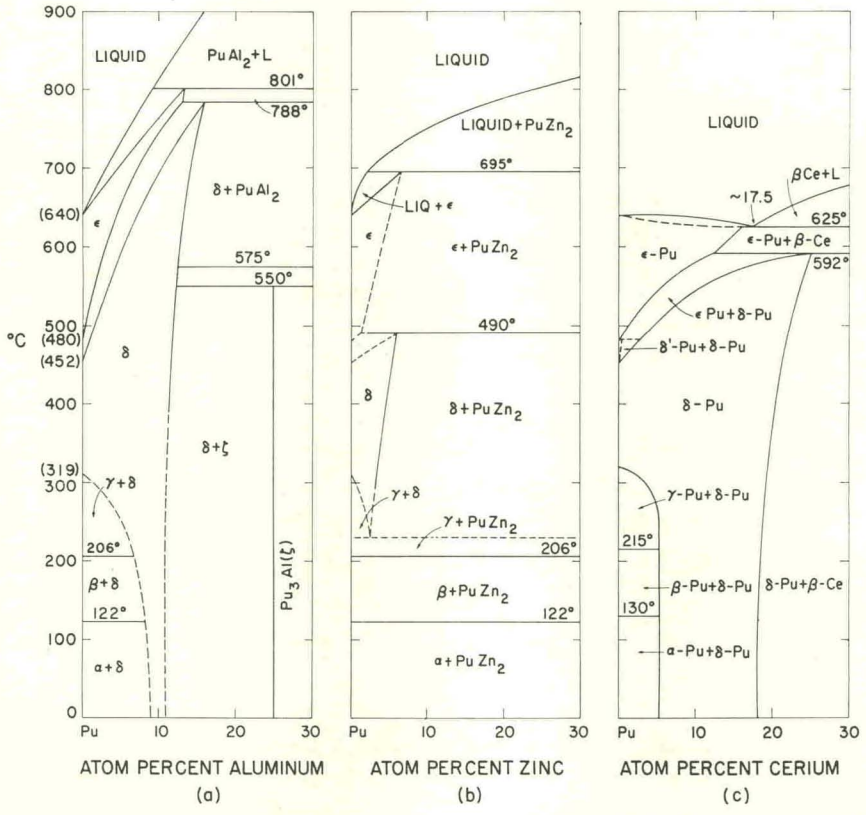

Fig. 14. Plutonium-rich regions of the (*a*) Pu-Al, (*b*) Pu-Zn, and (*c*) Pu-Ce phase diagrams.

atm *no* delta phase can be formed regardless of temperature. As can be seen in Table II, a delta-stabilized alloy containing 4.5 a/o Al should transform reversibly from delta to alpha at 10,200 atm and a delta-stabilized alloy containing 7.1 a/o Ce transforms reversibly from delta to beta at 3800 atm. These reversible transformation pressures increase with increasing alloying contents (see Fig. 8). Thus, the addition of aluminum or cerium has the effect of extending the delta-phase field with respect to pressure, similar to the effect produced by these alloy additions in extending the delta-phase field with respect to temperature [see Figs. 14(*a*) and 14(*c*)]. The stability of beta-phase

Pu-Ce alloys after compression suggests that cerium is probably more soluble in beta than in the gamma or alpha phases.

The Pu-Zn phase diagram shows a eutectoidal decomposition of delta phase into gamma phase plus $PuZn_2$ at about 235–243°C, and alpha phase plus $PuZn_2$ corresponds to the equilibrium state of decomposed alloys at room temperature[6] [see Fig. 14(*b*)]. Delta-stabilized Pu-Zn alloys are, therefore, actually metastable at room temperature and should transform under pressure to a more stable state. All delta-phase Pu-Zn alloys studied did transform under compression, substantially in agreement with this Pu-Zn phase diagram.

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