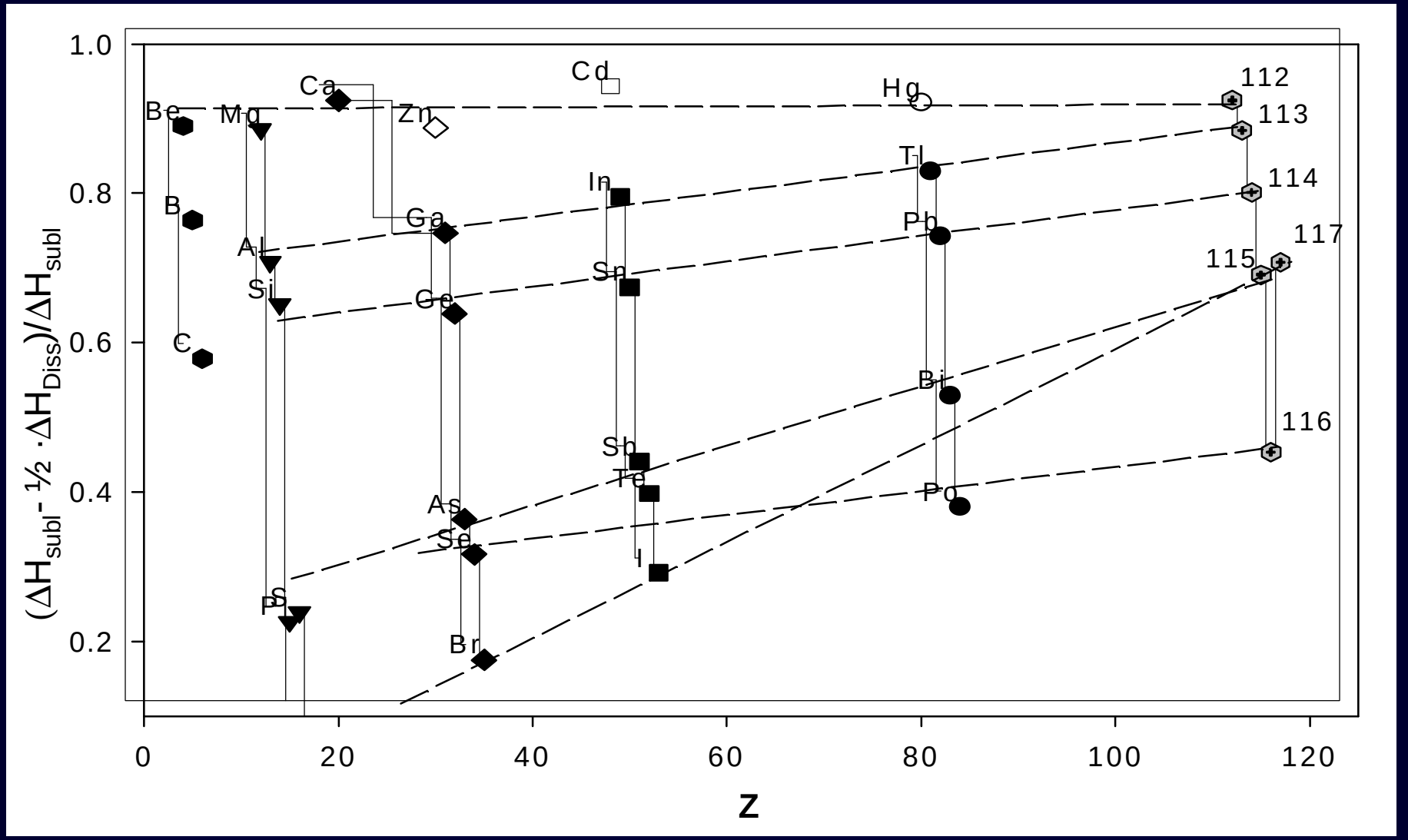
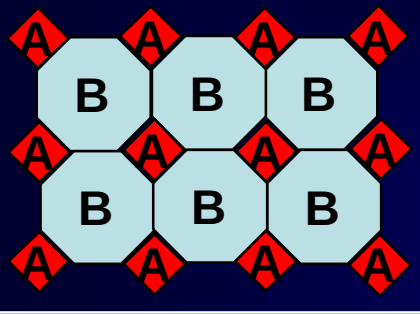
Transactinides

Metallic character



B. Eichler, Kernenergie, **19,** 307 (1976).

Miedema model: Intermetallic solution



$$\Delta H_{sol} = \frac{2 \cdot V_{Asol}}{n_{WSA}^{-1/3} + n_{WSB}^{-1/3}} \cdot \left(Q \cdot \left(n_{WSA}^{1/3} + n_{WSB}^{1/3} \right)^2 - P\left(\Phi_A^* - \Phi_B^* \right)^2 - R_m \right)$$

Semi empirical model adjusted to hundreds of binary compounds

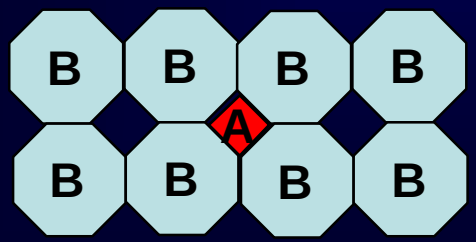
$$V_{Asol} = V_A \cdot \left(1 + a \cdot \left(\Phi_A^* - \Phi_B^* \right) \right)^{3/2}$$

A.R. Miedema, J. Less-Comm. Met. **46,** 67 (1975)

Eichler-Miedema model : Adsorption

In the surface: Au

$$\Delta H_{ads} = -\Delta H_{subl} + 0.9 * \left(\Delta H_{sol} - \frac{V_{Asol}}{V_B} \cdot \Delta H_{vvf} \right) + \frac{V_{Asol}}{V_B} \cdot \Delta H_{svf}$$



$$\Delta H_{svf} = 0.0574 \cdot T_m(B)$$

$$\Delta H_{vvf} = 0.0803 \cdot T_m(B)$$

B. Eichler, Radiochim. Acta **33,** 121(1983)

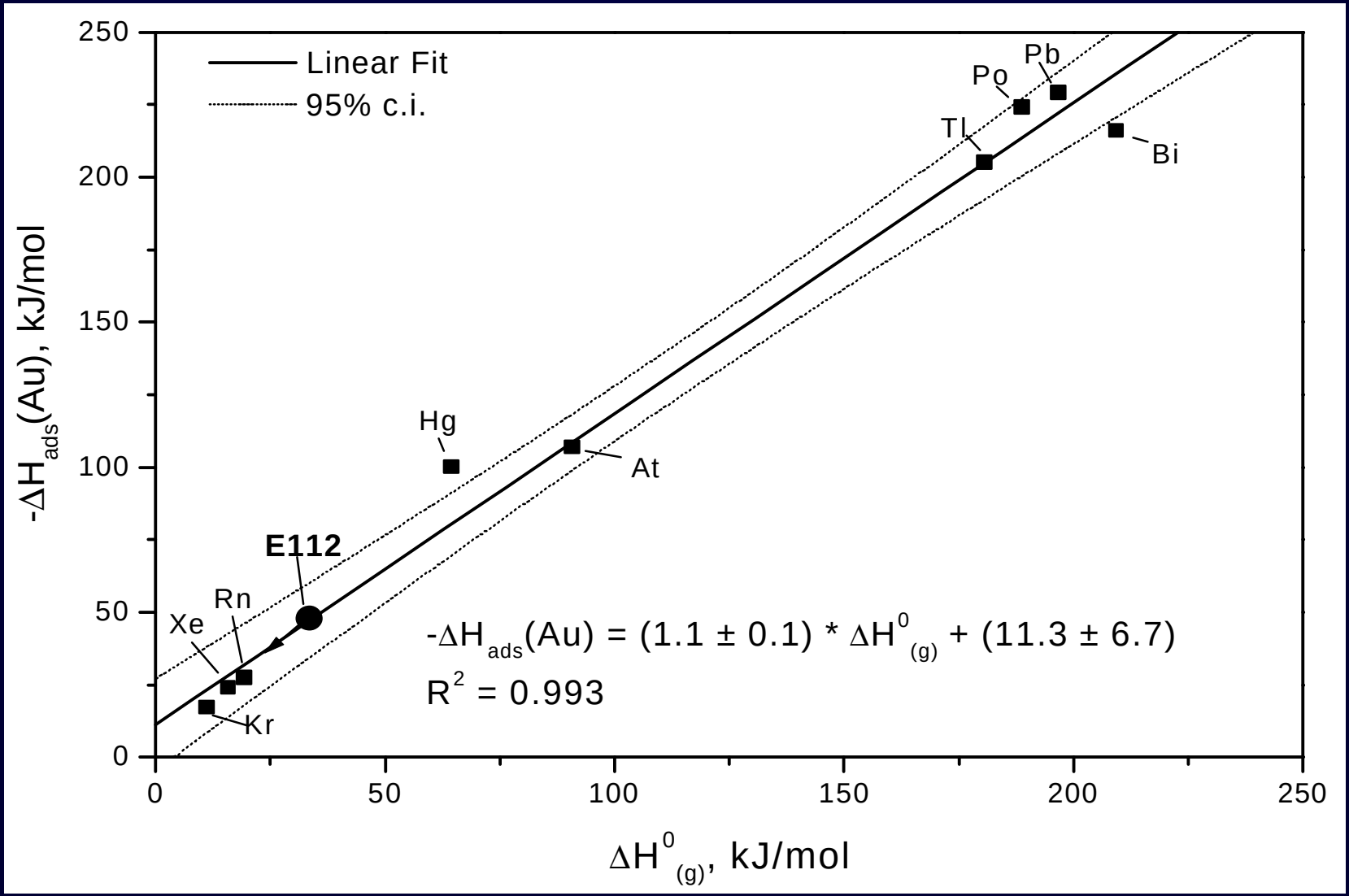
Transactinides

Eichler/Miedema Adsorption Enthalpies on Gold

Element	ΔH_{subl} [1] kJ/mol	$\Delta H^{M}_{ads}(Au)$ [2] kJ/mol	$T_{dep\ (COLD)}$ °C
112	39	-43	~ 25
113	234	-238	~ 600
114	190	-218	~ 500
115	184	-216	~ 500
116	146	-206	~ 500

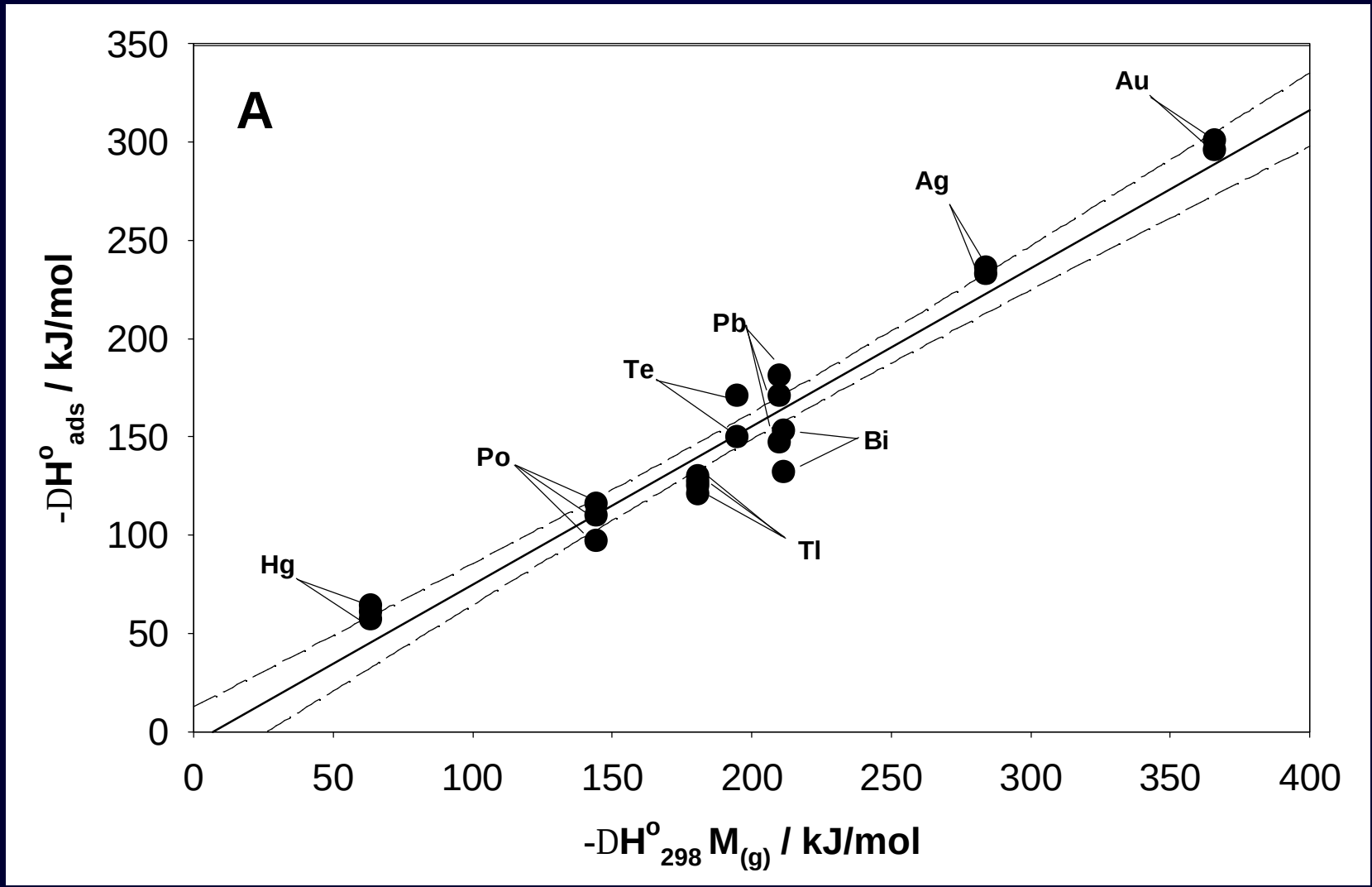
[1] B. Eichler, PSI Report 03-01, Villigen, 2003.
[2] B. Eichler, PSI Report 00-09, Villigen, 2000.

Adsorption on Gold



R. Eichler PSI Annual report 2003, 4 (2004)

Adsorption on Quartz



Eichler, B., Kim, S.C.: Isotopenpraxis 21, 180 (1985).

Transactinides

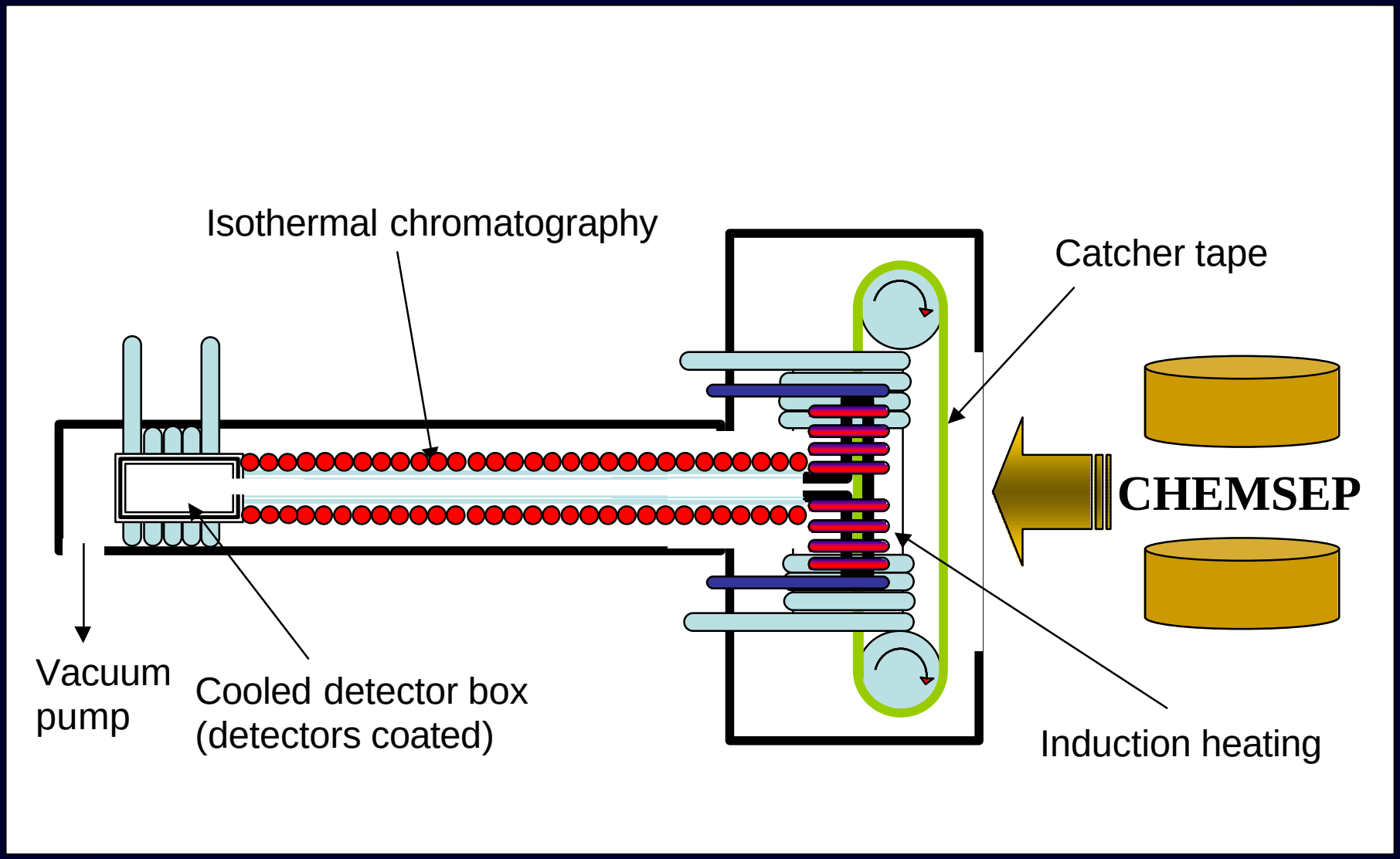
Adsorption enthalpies on quartz compared to gold calculated by use of correlations

Element	ΔH_{subl} [1] kJ/mol	ΔH_{ads}(Quartz) kJ/mol	ΔH_{ads}(Au) kJ/mol
112	39	-25	-53
113	234	-182	-269
114	190	-148	-220
115	184	-143	-214
116	146	-112	-149
117	93	-68	-110
118	24	-13	-38

[1] B. Eichler, PSI Report 03-01, Villigen, 2003

Transactinides

Vacuum chromatography



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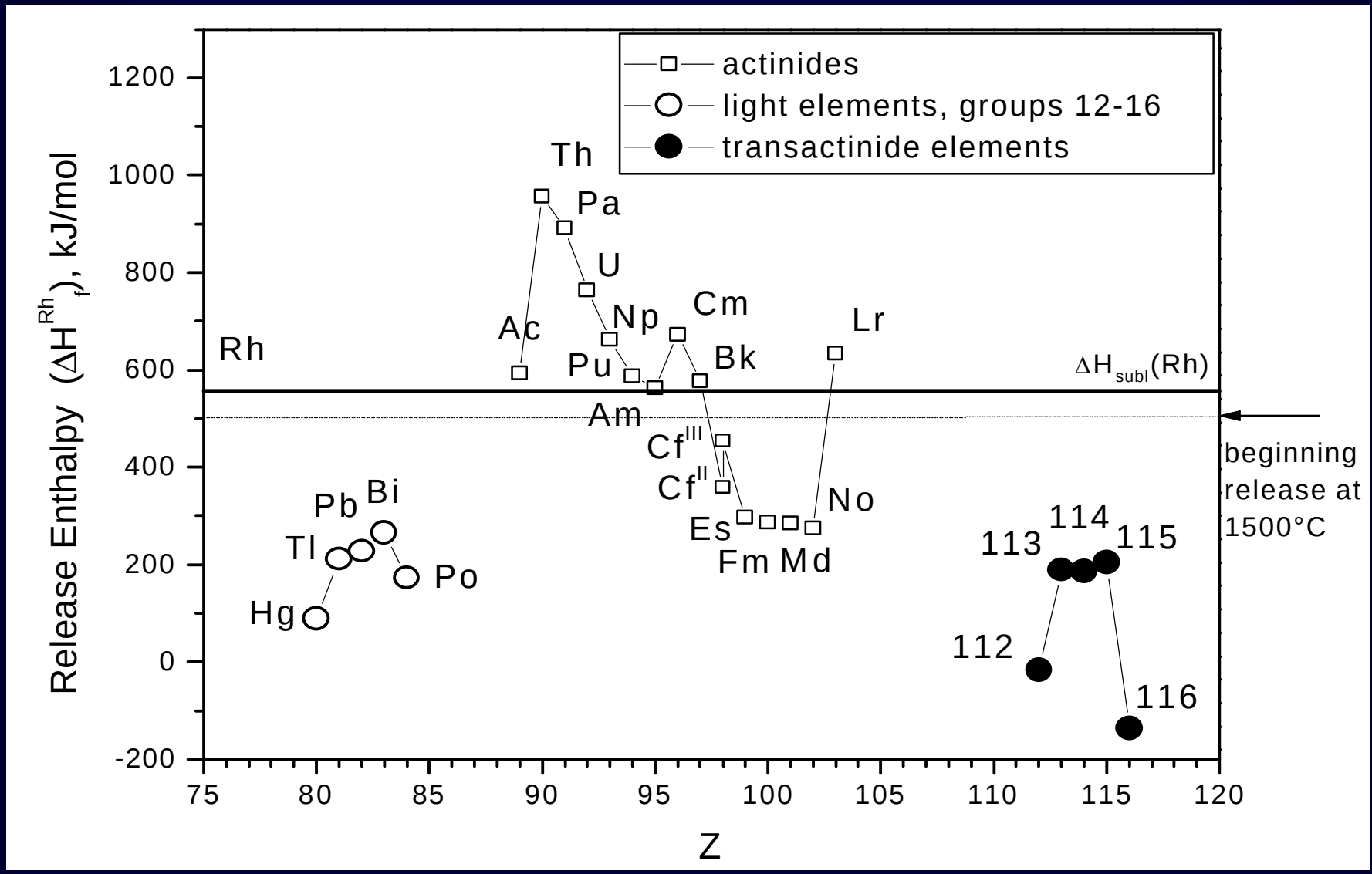
Hot targets

Intermetallic actinide compounds with Rh



R. Eichler PSI Annual report 2003, 8 (2004)