Особенности P-T фазовых диаграмм RE_2O_3 (RE=La-Lu

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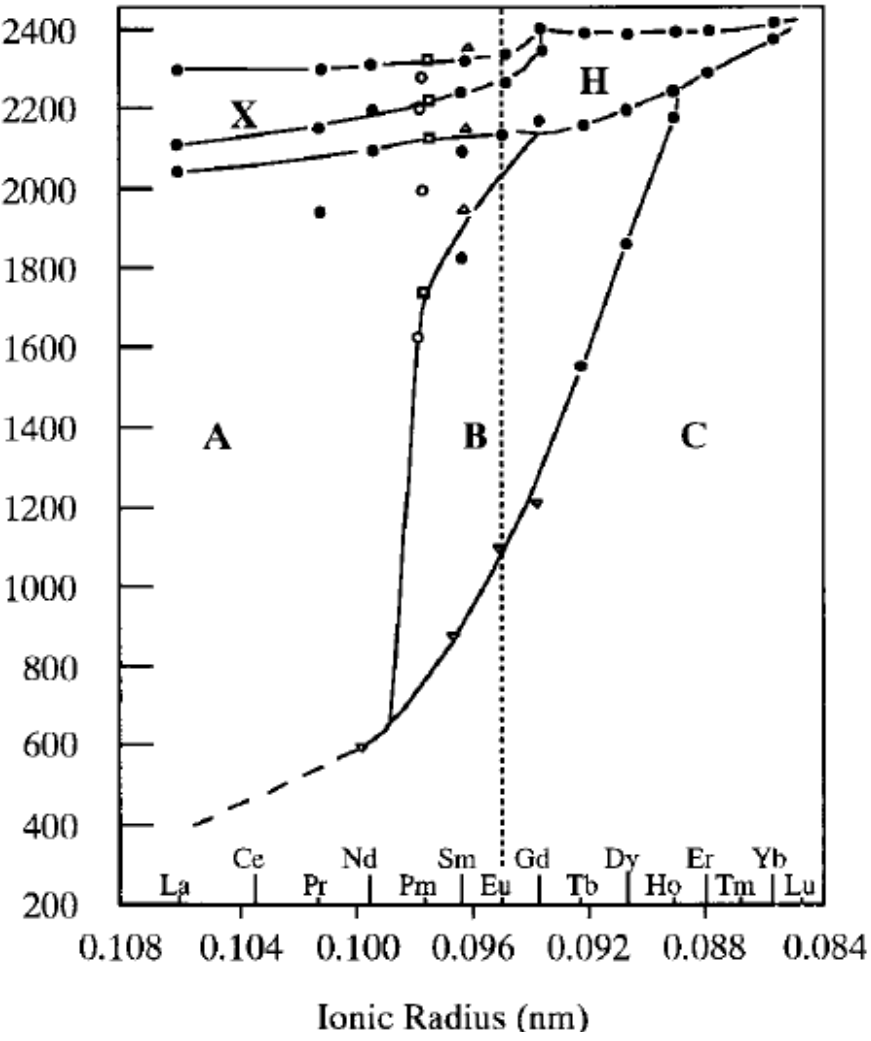
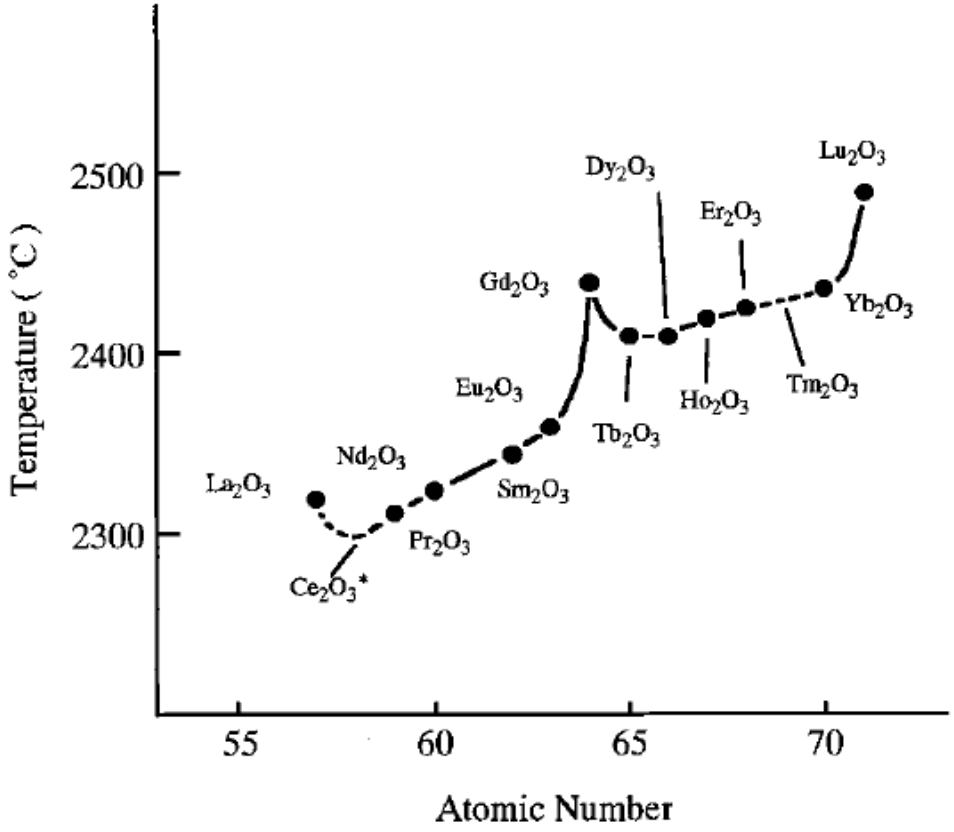
Goldschmidt V. M., Ulrich F., Barth T. *Norske. Videnskaps.-Akad. Skrifter, Oslo, I. Mat.-Naturv.* Kl., No. 5, 5-24 (1925).



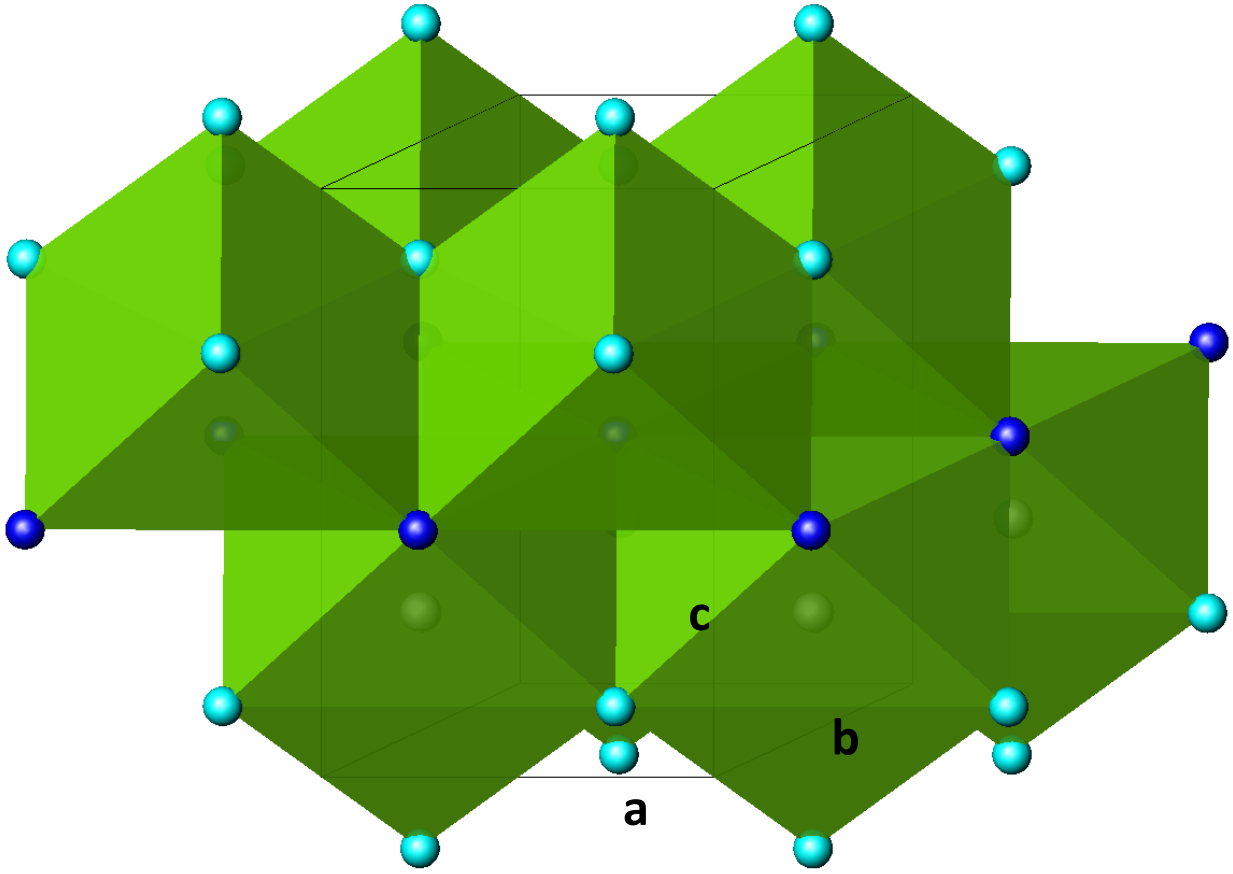


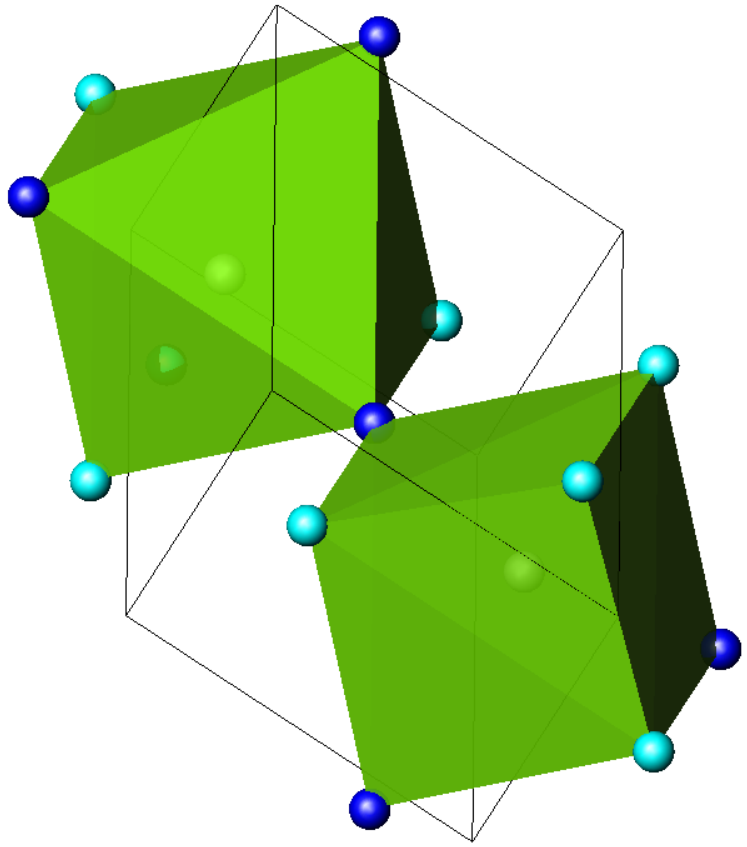
Coutures, J.-P.; Verges, R.; Foëx, M. *Rev. Int. Hautes Te*
Re´fract. **1975**, *12*, 181.

M.; Traverse, J. P. *Rev. Int. Hautes Temp. Re´fract.* **1966**, *3*, 429.

A-RE_2O_3 (RE=La, Ce, Pr, Nd, Pm)

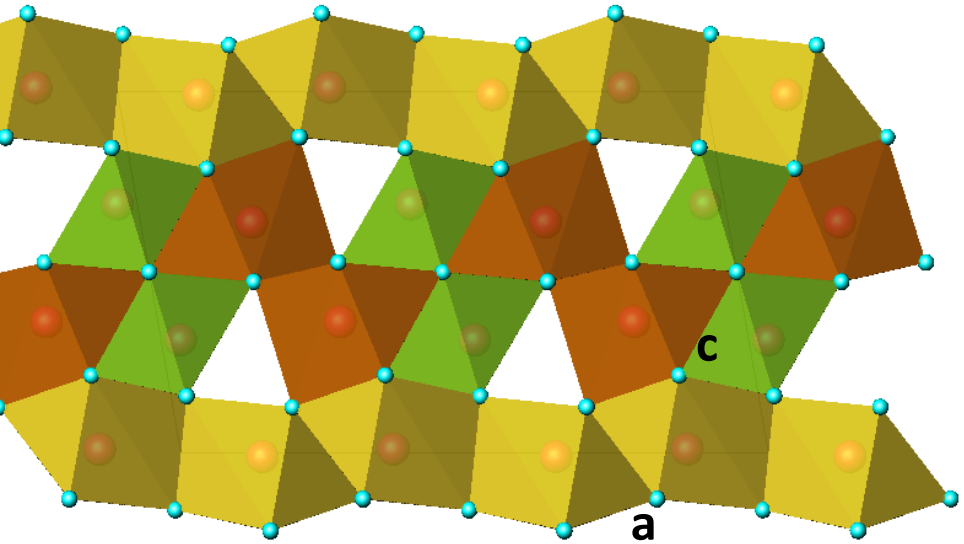
a=3.937 - 3.802 Å, c=6.129 - 5.954 Å, V= 82.285 - 74.535 $Å^3$, S.G. *P -3m1*, Z=1

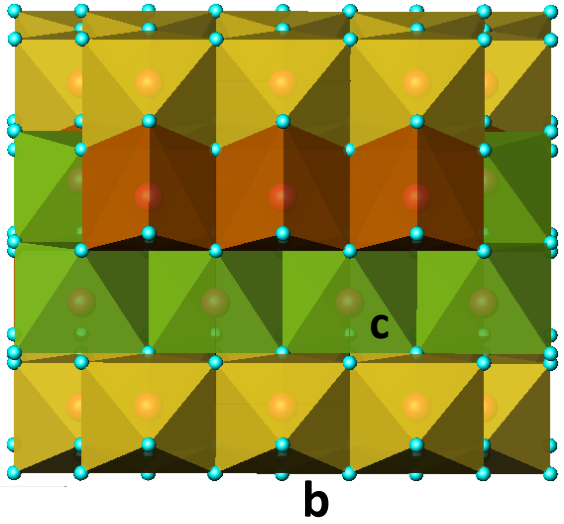


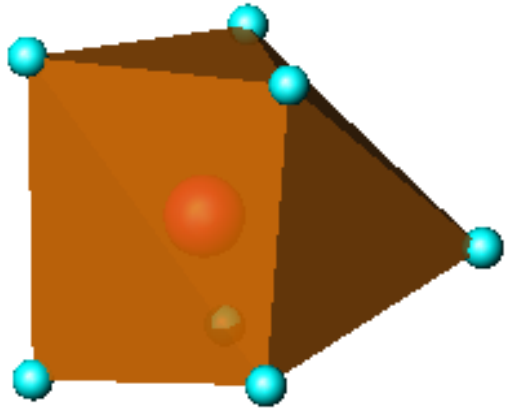


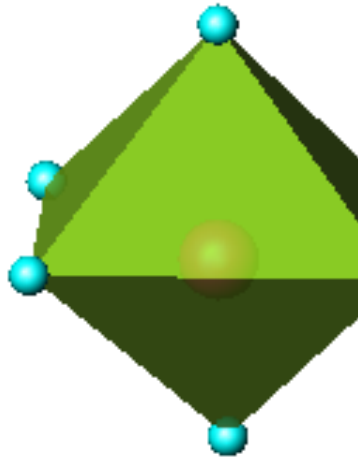
B-RE_2O_3 (RE=Sm, Eu, Gd)

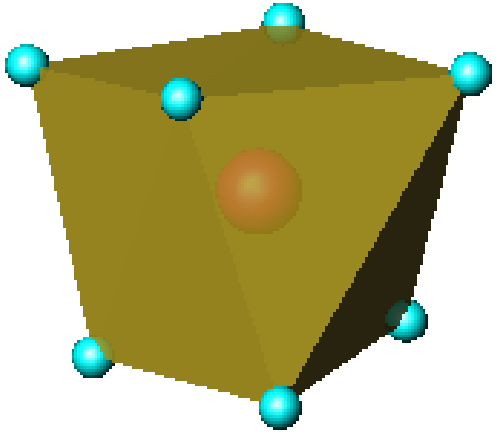
=14.170 - 14.061 Å, b=3.63 - 3.566 Å, c=8.840 - 8.760 Å, β=99.96 - 100.10°, V= 447.84 - 432.42 $Å^3$, S.G. *C 2/m*, Z=





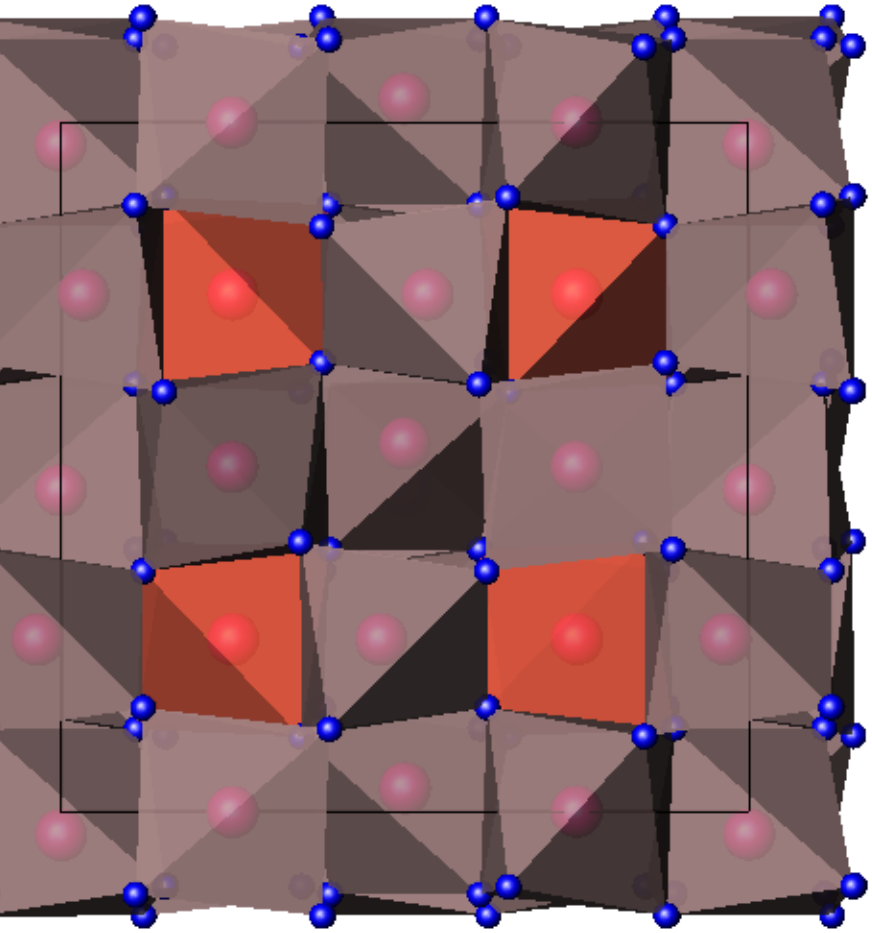


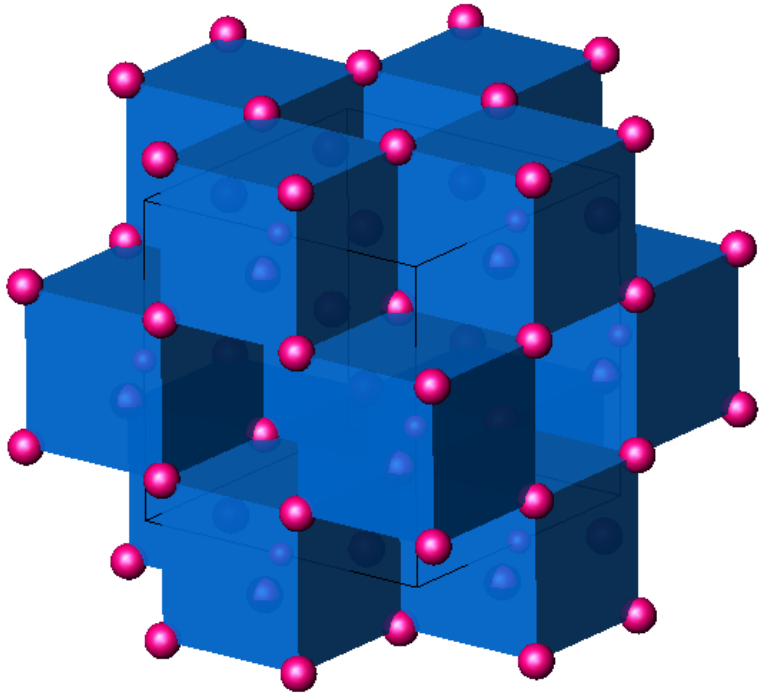




C-RE_2O_3 (RE=Sm, Eu, Gd, Tb, Dy, Er, Tm, Yb, Lu)

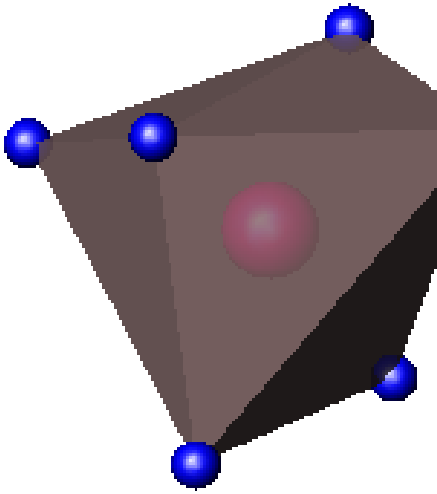
a=10.932 - 10.391 Å, V= 1306.4 – 1121.6 $Å^3$, S.G. *I -a3*, *Z*=16

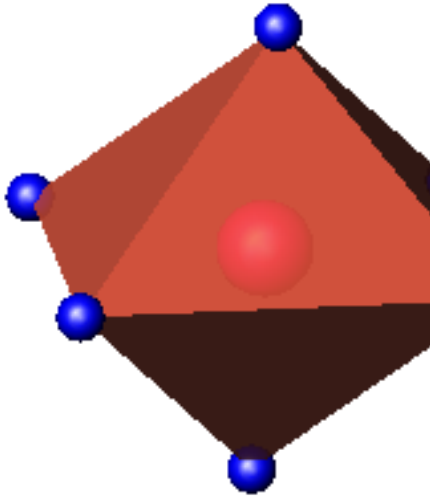


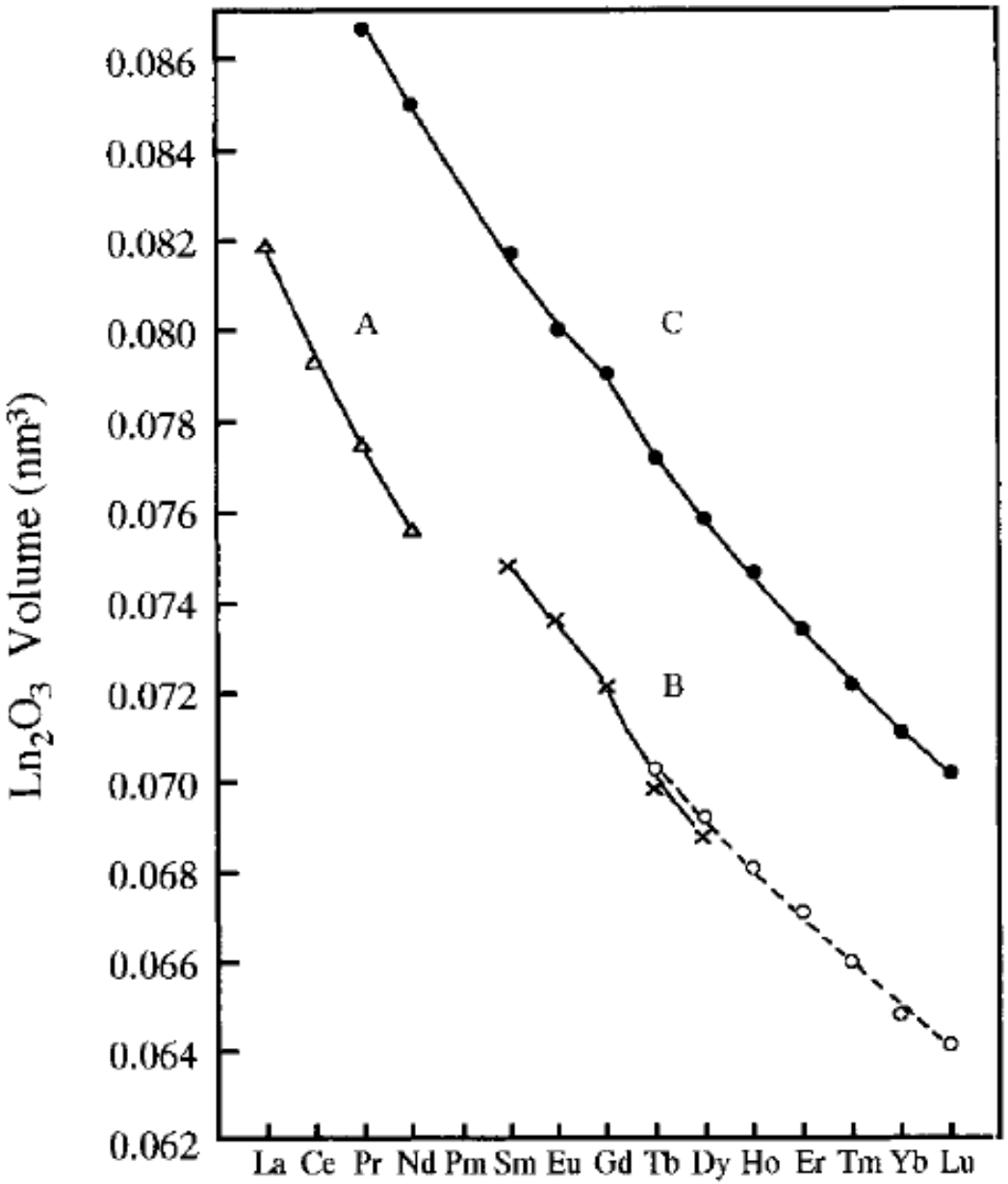


CaF_2 fluorite

a=5.4712 Å



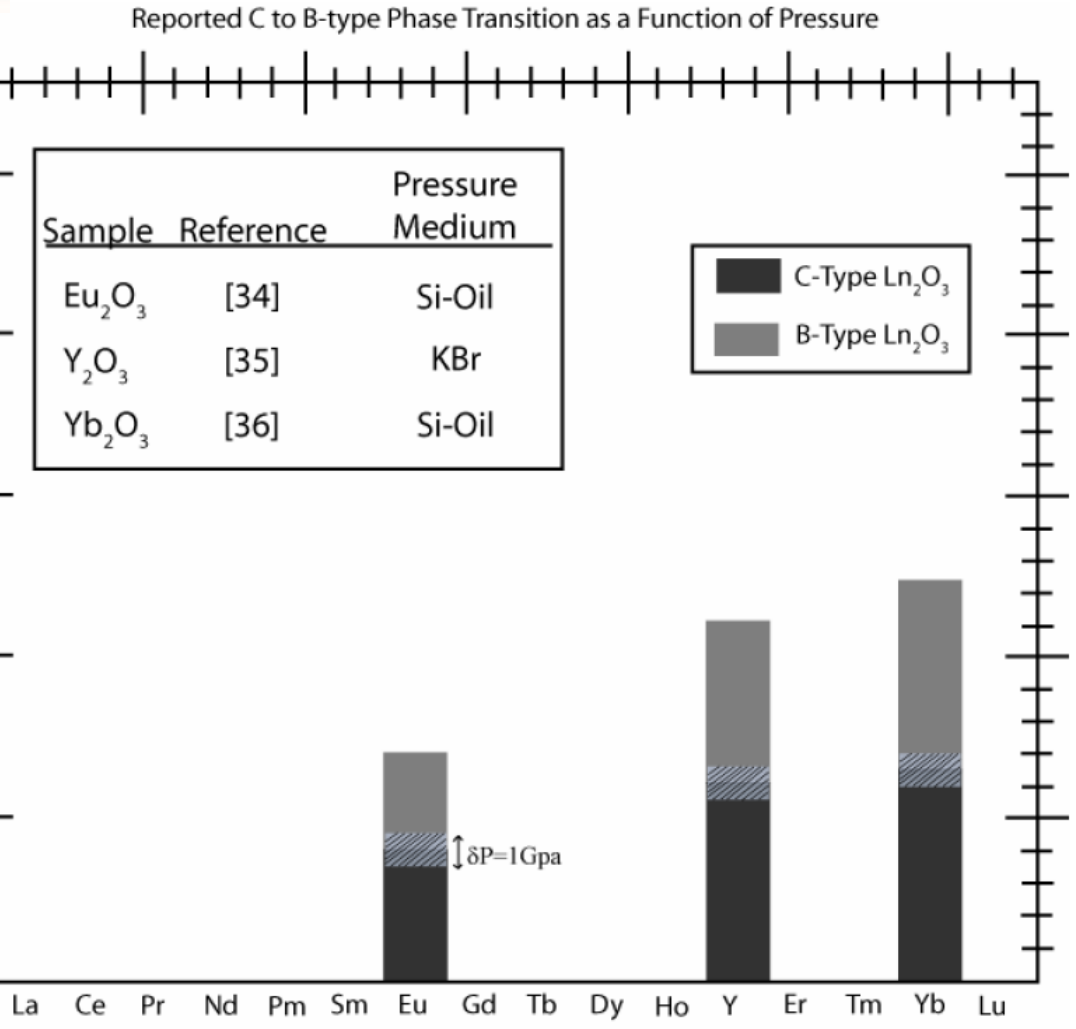




Hoekstra, H. R.; Gingerich, K. A. *Science* **1964**, *146*, 1163.

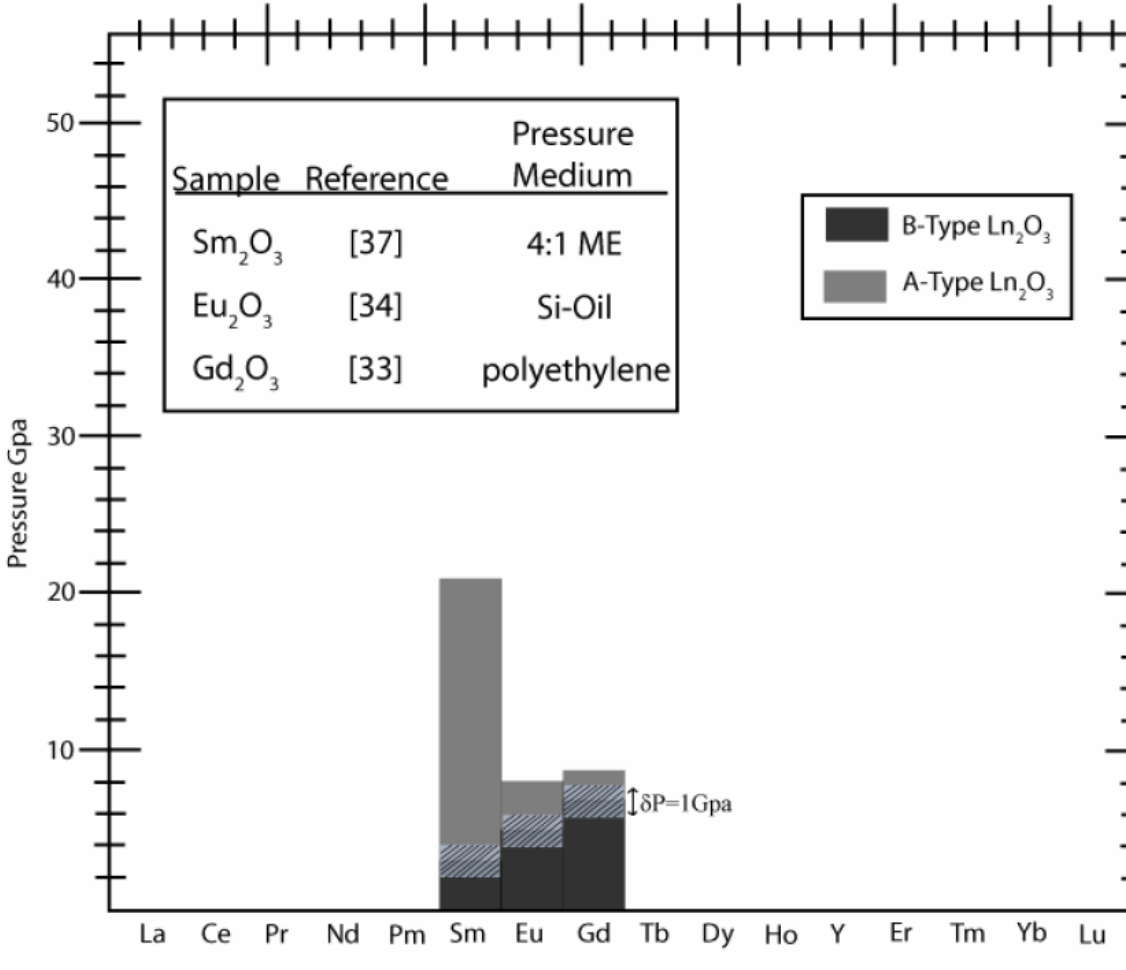
Reported C to B-type Phase Transition as a Function of Pressure

Sample	Reference	Pressure Medium
Eu_2O_3	[34]	Si-Oil
Y_2O_3	[35]	KBr
Yb_2O_3	[36]	Si-Oil

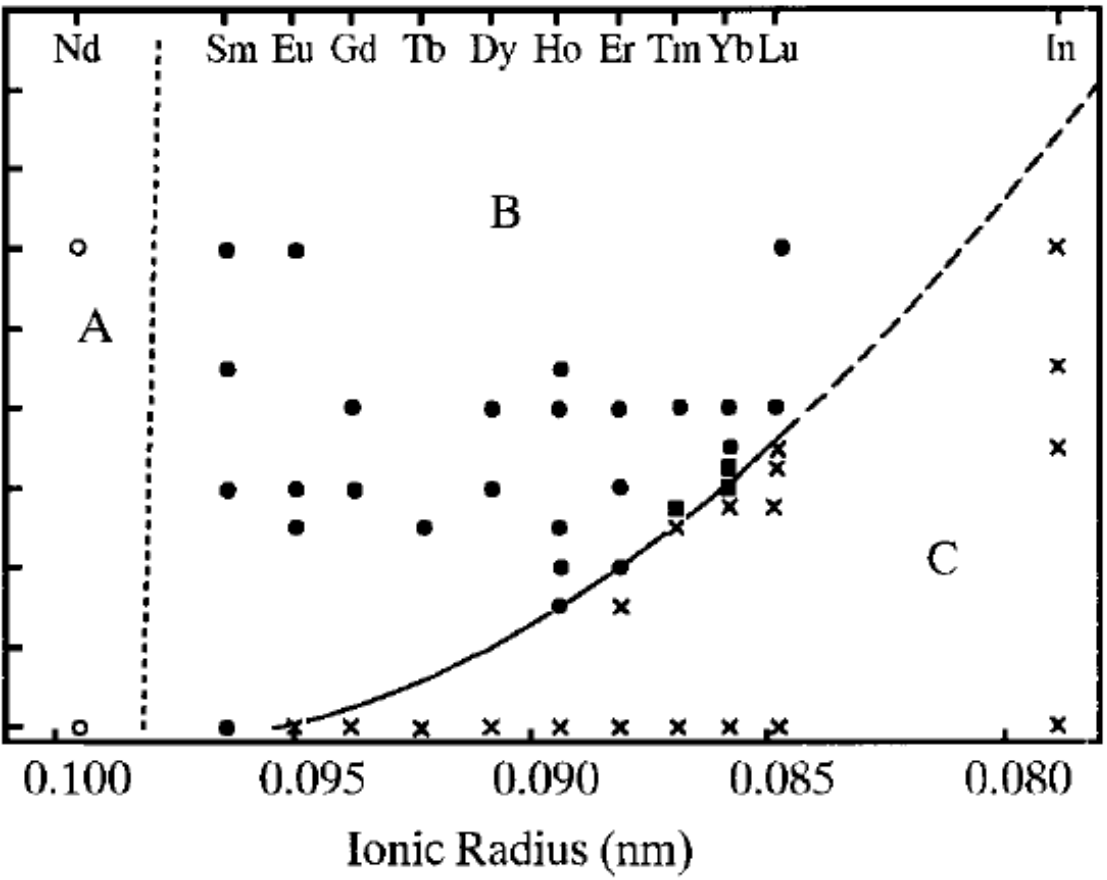


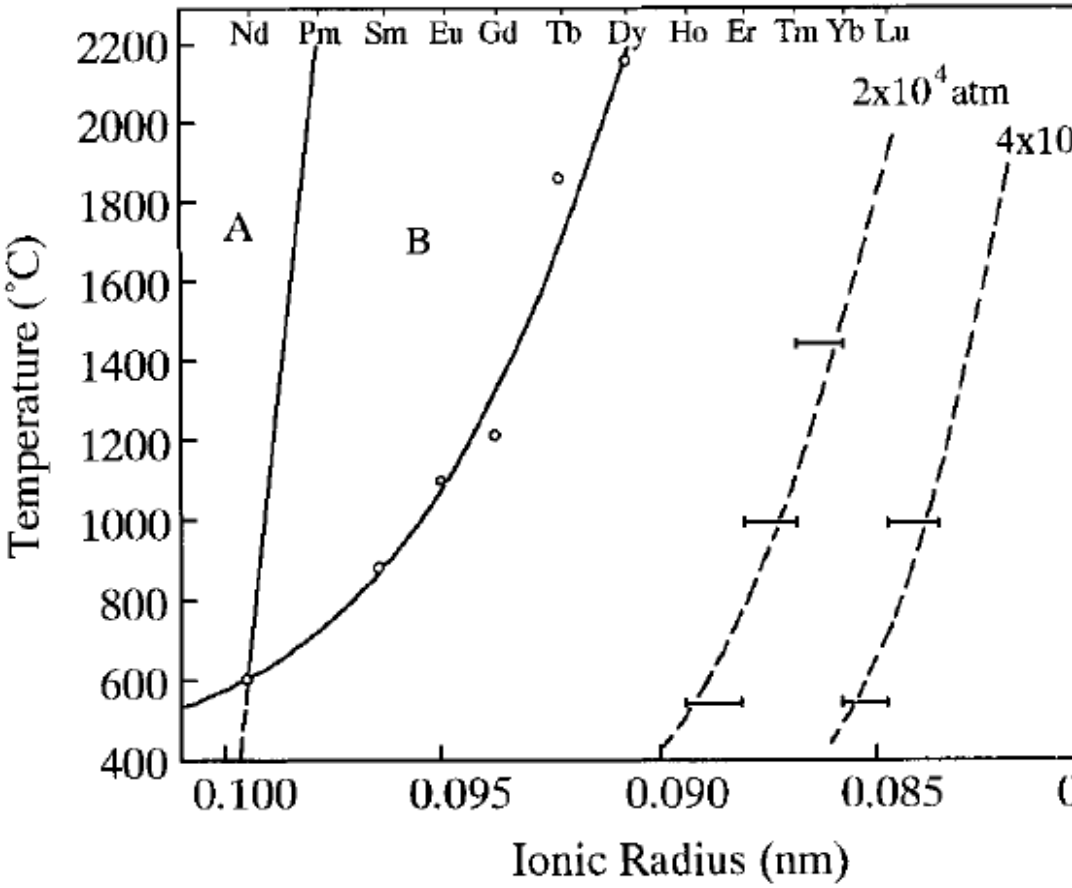
Reported B to A-type Phase Transition as a Function of Pressure

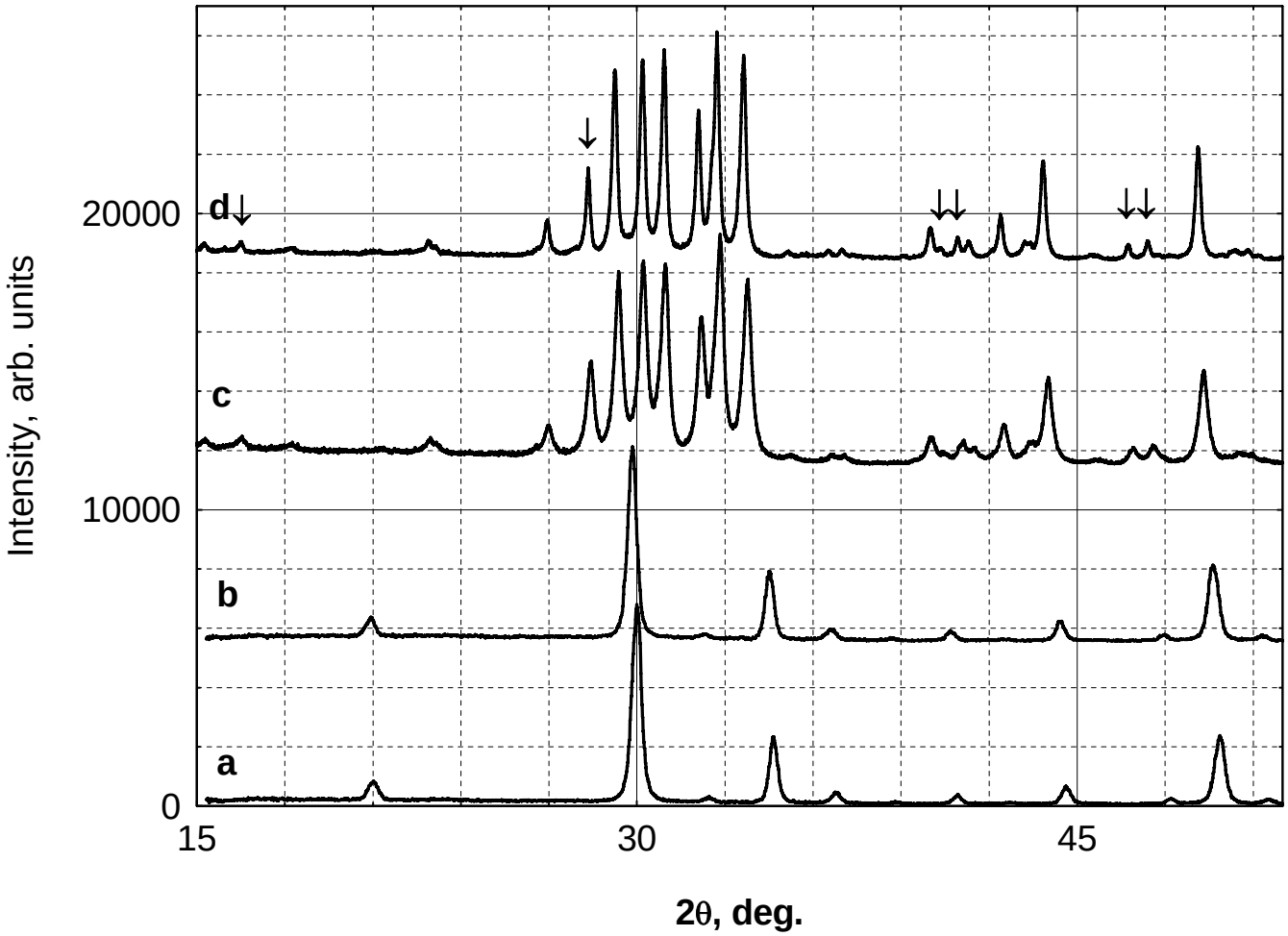
Sample	Reference	Pressure Medium
Sm_2O_3	[37]	4:1 ME
Eu_2O_3	[34]	Si-Oil
Gd_2O_3	[33]	polyethylene



H.R.Hoekstra *Inorg. Chem*. 5, N5, 754-757, 1966.







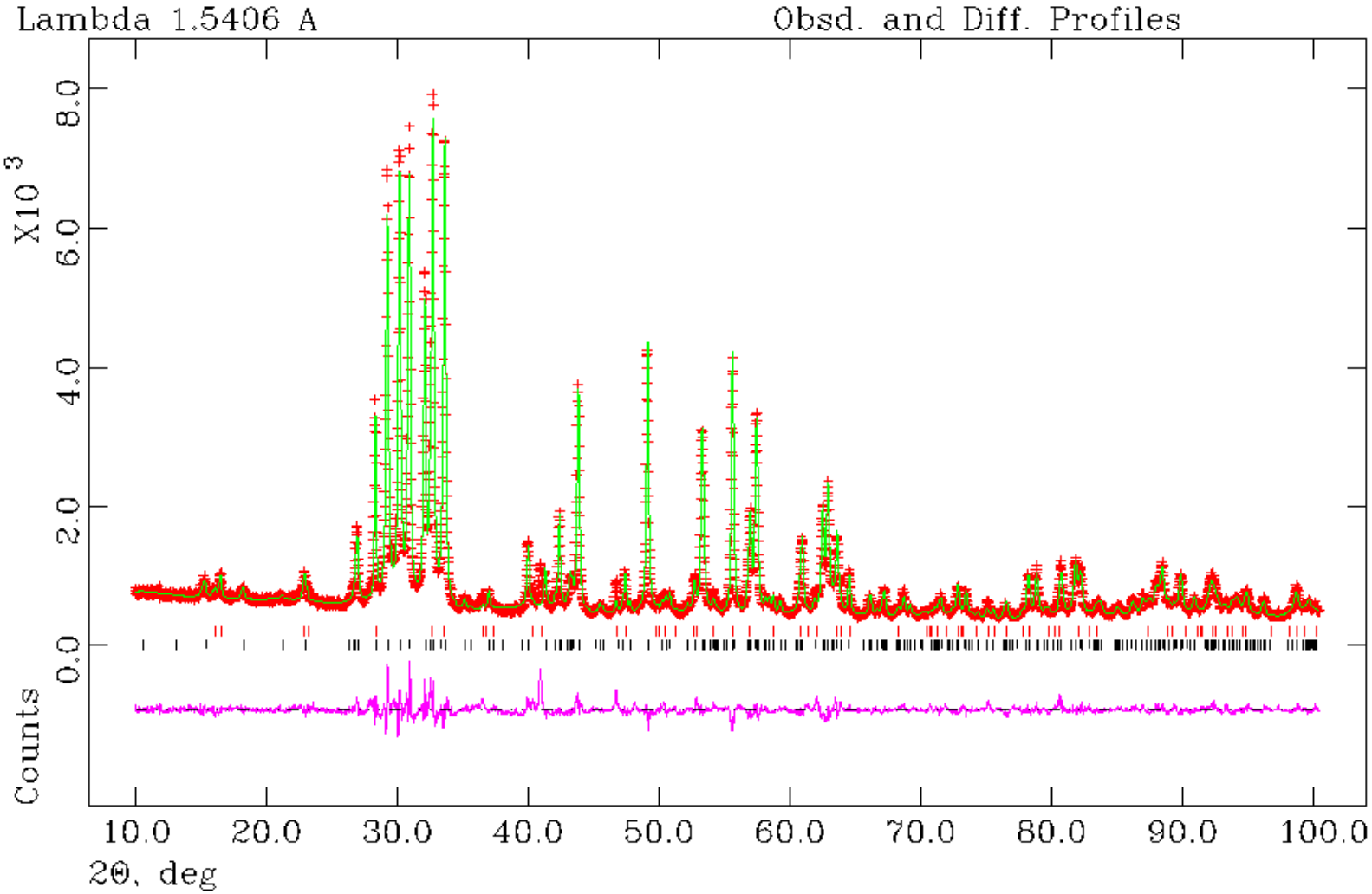
Tetragon.
a=5.4915(8), c=5.3450(9) Å
V=160.97 Å^3

y diffraction patterns of: starting C-Lu_2O_3 – a; starting C-Yb_2O_3 – b; Lu_2O_3 after ment at P=5.0 GPa, T=1000 C – c; Yb_2O_3 after treatment at P=5.0 GPa, T=1000 C – rrows mark the peaks belonging to unknown phase.

А.А.Кашаев, Л.В.Ущаповский и А.Г.Ильин «Электронографическое и рентгенографическое исслед
окислов редкоземельных металлов в тонких пленках» Кристаллография, 20, №1, 192-195, 1975.

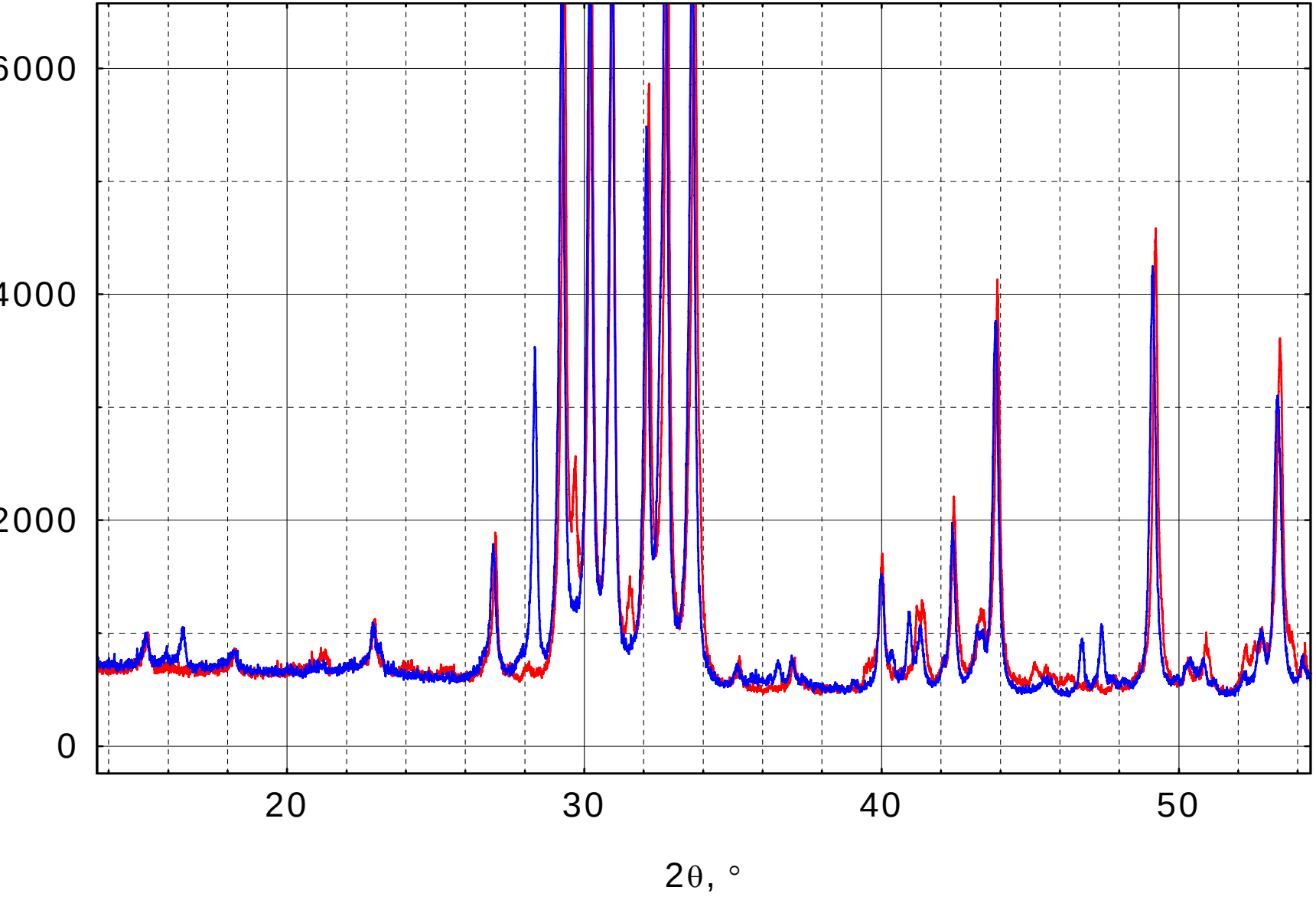
Gd, Tb, Dy, Ho, Er a=5.31(1) , 5.27(1) , 5.21(1) , 5.18(1) , 5.15(1) Å, П.Г. *F m3m*.

NaCl, ZnS, CaF_2.



Синяя дифрактограмма – 5.0 ГПа, 1000

Красная - 5.0 ГПа, 1350 С, 30 сек.



Вывод

Даже в простых системах, в которых, казалось бы, все ясно и понятно можно обнаружить новые явления и свойства. Надо быть просто очень внимательным, ко проводишь исследования.

Спасибо за внимание

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