

ISTITUTO DI CHIMICA FISICA

UNIVERSITÀ DI GENOVA

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16132 GENOVA

14th January 1971
GENOVA, ...

To prof. John Francis Cannon
Associate Director
Brigham Young University
PROVO, UTAH 84601 (U.S.A.)

Dear prof. J. Francis Cannon,

November 20.

thank you for your letter of

We know already the results obtained by D.B. McWhan on the Ce at high pressure. McWhan himself wrote to us to have an exchange of opinions on this subject. Nevertheless we are unable to explain the discrepancy between his and our results.

The method adopted, allowed us to obtain X-ray films very poor of lines, but any change in the crystal structure appears to occur until about 80 kilobars of pressure: we observed only a collapse in the atomic size of Ce at 50 Kbars.

These results were satisfactory used by Coqblin, Ratto and Galleani d'Agliano to explain theoretically the superconducting state of Cerium under pressure. (*)

I hope the enclosed X-ray data are what you wanted.

Yours sincerely,

Enrico Franceschi

(E. Franceschi)

(*) "Superconductivity of Lanthanum and Cerium at high pressures"
Solid State Communications, vol.7, (1969), pp.1387-1390.

JAN 22 1971

α -Ce $T = 298^\circ\text{K}$; $P = 49.5$ Kbar

$$a = 4.73 \overset{\circ}{\text{\AA}}$$

hkl	d_{obs}	d_{calc}	I_{obs}	I_{calc}
111	2.73_1	2.73_1	s	100
200	2.36_1	2.36_5	m	51
220	1.67_2	1.67_2	w	38
311	1.42_6	1.42_6	w	46

α' -Ce $T = 298^\circ\text{K}$; $P = 74.5$ Kbar

$$a = 4.66 \overset{\circ}{\text{\AA}}$$

hkl	d_{obs}	d_{calc}	I_{obs}	I_{calc}
111	2.69_1	2.69_0	s	100
200	2.33_9	2.33_0	m	51
220	1.65_0	1.64_8	w	37
311	1.40_1	1.40_5	mw	45

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