known geometrical array of individual atoms—all noble gases (except the special case of He) crystallize in the face centered cubic lattice (space group $-O_h^5$ or $Fm3m$)—with weak van der Waals forces holding the lattice together. The equation of state of frozen Ne, Ar, Kr and Xe was developed already twenty years ago by KANE.[10] Recently, the quantum mechanical variational method was applied to an Einstein model of a solid and the equation of state of the same solid gases developed by

TABLE 1.—SELECTED VALUES OF THE ATOMIC CONSTANTS OF THE SOLID NOBLE GASES, ALL AT 0°K

Metal	D_0, °K. (g/cm³)	Lit.	At.wt. $^{12}C = 12{\cdot}0000$	$V_{at.}^{0°K.}$ (cm³/g atom)	v_0 (Å³/atom)	a_0 (Å)	d_0 (Å)	Crystal System	Atoms/ cell	Space Group
Ne	1·544	13	20·183	13·07	21·70	4·427	3·131	f.c.c.	4	O_h^5
Ar	1·827	13	39·948	21·86	36·29	5·255	3·716	f.c.c.	4	O_h^5
Kr	3·093	14	83·80	27·09	44·96	5·645	3·991	f.c.c.	4	O_h^5
Xe	3·783	15	131·30	34·71	57·60	6·131	4·335	f.c.c.	4	O_h^5
Em	(5·25)		222·0	(42·3)	(70·2)	(6·50)	(4·63)	(f.c.c.)	(4)	(O_h^5)

TABLE 2.—BERNARDES'[11] SELECTION OF NOBLE GAS CONSTANTS

Metal	V_{at}@ 0°K (cm³/g atom)	Heat of Sublimation at 0°K (cal/g atom)
Ne	13·1	420
Ar	22·6	1852
Kr	27·5	2630
Xe	35·1	3824

BERNARDES.[11] The change of volume with pressure and the compressibility follow directly from the two-body potential parameters (σ and ε), which are selected to give the best fit with the experimental atomic volume and heat of sublimation, both at 0°K (see Tables 1 and 2). The theoretical deviation of quantum mechanical laws of corresponding states from classical behaviour for the various properties, including compressibility, of the solid noble gases at 0°K was also determined recently by BERNARDES.[12]

The most precise lattice parameters of solid neon and argon at 4·2°K were determined by neutron diffraction by HENSHAW[13] and those of krypton[14] and xenon[15] by SMITH from X-ray data at 20° to 120°K.

The values selected by us are correlated in Table 1. It should be clarified here that the inorganic chemist is used to compare atomic volumes, $V_{at.}$, in cm³/g atom, defined as at. wt./density, D, in g/cm³, while the crystallographer uses the dimensions and angles of a unit cell. The physicist thinks of the same properties in units of

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