which use acoustic isotherm data, they show that there are small errors in the method which generates B from f. At present these errors (which are sometimes 3%) are smaller than the 5–10% uncertainties in the data[5,6] for f.

Tentative refinements[5] of the ansatz method for obtaining B from f do not significantly improve the accuracy of the method. It is arguable that the simplest ansatz should be retained and that the error of method be treated as a systematic error to be corrected by model calculations.

The term "consistency of data" can be used without model calculations and without objection to mean: a functional form fits data for B. When used in Eqs. (1) and (2), it fits data for μ or f. Such data are consistent with B and "give support" to it.

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Angular Distribution of Photoelectrons: Outer Shells of Noble Gases

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Results of calculations of angular distributions of photoelectrons from the outer p subshells of Ne, Ar, Kr, and Xe are presented for electron energies between 0 and 2 Ry (27.2 eV).

In a recent paper,[1] the angular distribution of photoelectrons resulting from x-ray absorption in Kr was calculated within the framework of a central potential model.[2] While calculations of this type are only expected to be realistic at photon energies considerably above the threshold for ionization of a particular subshell, they may serve as a first-order estimate of the angular dependence of photoelectrons at lower energies. Since a number of experiments have been performed or are currently underway[3–8] on measurements of the angular dependence of ejected electrons, we have extended the calculations reported in Ref. 1 to include all of the outer subshells of the rare gases Ne, Ar, Kr, and Xe.

Our results for the asymmetry parameter[9] β for $2p$, $3p$, $4p$, and $5p$ subshells in Ne, Ar, Kr, and Xe for final electron energies between 0 and 2 Ry energy units (0 and 27.7 eV) are shown in Fig. 1, and are compared with available experimental evidence. While neither these calculations nor experiments yet give reliable enough information to attempt quantitative comparison there appear to be the following trends: (1) Both the calculations and experiment show larger asymmetry for Xe than for Kr and for Kr than Ar. (2) The calculated cross sections for these gases show an increase in β for electron energies between 0 and 1 Ry. This is consistent with the experimental results for Xe for electrons due to $^2P_{3/2}$ and $^2P_{1/2}$ ionization[3] and also with the results of Ref. 7 which employed several photon energies.

Our calculations suggest the following behavior for the asymmetry parameter β as a function of energy:

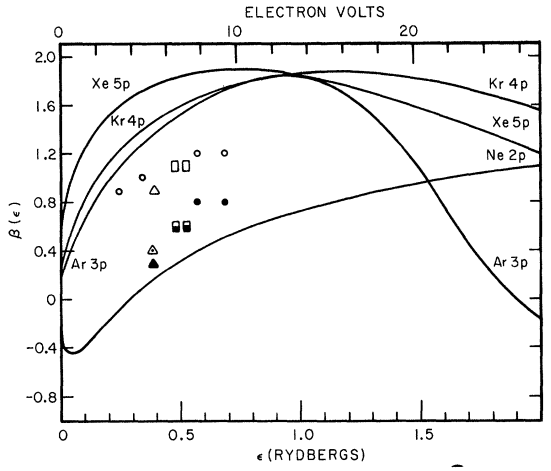

FIG. 1. Asymmetry parameter $\beta(\epsilon)$ for the outer p subshells of the noble gases as a function of photoelectron energy ϵ. The solid curves are the results of our calculations while the triangles, squares, and circles are the experimental results for Ar, Kr, and Xe, respectively; open triangle with dot: Ref. 3; half-filled square: Ref. 4; solid triangle and circles: Ref. 5; and open triangle, square, and circle: Ref. 6.

(i) An increase to a maximum value in the range 10–20 eV above threshold followed by a decrease for elements with $3p$, $4p$, and $5p$ subshells. The rise near threshold is consistent with experimental evidence. Note that in the calculations presented here β must decrease at higher energies since the dipole matrix element for np-ϵd transitions vanishes at some energy above the ionization threshold.[10] This in turn means that $\beta=0$ at that point. We expect β to vary less rapidly as a function of energy than is shown by our calculations,[11] so that the actual behavior of β as a function of electron energy is probably flatter than our curves indicate. Also the β values for Ar $3p$ should decrease more rapidly than for Kr $4p$ and Xe $5p$. Experimental confirmation of these trends would be desirable.

(ii) The behavior of β for Ne $2p$ ionization is different than for the heavier rare gases. Actually we expect our calculations for Ne to be more reliable than for the heavier rare gases except near threshold. Accordingly we expect (a) that β for Ne $2p$ shell electrons will have near zero values in the threshold region, (b) β values for Ne will be less than those for the heavier rare gases in the 5–15-eV range of electron energies but will be larger than those for the heavier rare gases at higher electron energies. The calculations are not realistic enough to attach any meaning to the negative values we calculate for β between 0 and 4 eV although the actual value of β is probably small in this energy range.

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[9]Equation (8) of Ref. 1 which defines β is incorrect. The term $(\delta_{l+1}-\delta_{l-1})$ should be $\cos(\delta_{l+1}-\delta_{l-1})$. Also the points shown in Fig. 4 of Ref. 1 for energies below 100 eV are incorrect due to a programming error.

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[11]Note, however, that in the vicinity of autoionizing resonances where the total cross section for photoionization is rapidly varying as a function of energy one would also expect β to vary rapidly.

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ERRATA

Proof of a Conjecture for Large Wave Numbers in Mihara and Puff's Theory of the Structure Factor of Liquid Helium. Garrison Sposito [Phys. Rev. 182, 284 (1969)]. The cubic fluctuation of $\hat{H}-\underline{E}_F(\vec{k})$ in the Bijl-Feynman state $|\vec{k}\rangle$ was incorrectly shown to vanish identically when the wave number $\underline{k}$ is large enough to make the liquid structure factor $\underline{S}(\underline{k})$ equal to unity. The error occurs in the term of $\langle\vec{k}|[\hat{H}-\underline{E}_F(\vec{k})]^3|\vec{k}\rangle$ involving the two-body potential between helium atoms. Specifically, the second term in the quantity near the top of p. 286 should be evaluated as

$$\frac{1}{2}\int\sum_{t,n}e^{i\vec{k}\cdot(\vec{r}_n-\vec{r}_t)}\sum_{p\neq q}\left(\frac{\vec{k}}{m}\cdot\vec{\nabla}_t\psi_0\right)\left[v(\vec{r}_{pq}),\left(\frac{\vec{k}}{m}\cdot\vec{\nabla}_n\right)\right]\psi_0 d\vec{r}^N$$

$$=-\frac{1}{2}\int\sum_{t,n}e^{i\vec{k}\cdot(\vec{r}_n-\vec{r}_t)}\sum_{p\neq q}\left(\frac{\vec{k}}{m}\cdot\vec{\nabla}_t\psi_0\right)\left(\frac{\vec{k}}{m}\cdot\vec{\nabla}_n v(\vec{r}_{pq})\right)\psi_0 d\vec{r}^N$$