plicated in this structure by ionic II—IV interaction.) Though this approach neglects a number of important factors, it can give a useful indication of energy gap in cases in which it has not been measured.

The new group of chalcopyrite compounds allow an extension of the Grimm–Sommerfeld rule[5]. Lattice constants are in agreement with covalent radii; thus $ZnGeAs_2$ has an 'a' repeat distance (5·67 A.) almost identical with those of GaAs and Ge (5·64 and 5·66 A.).

Compositions $CdSnP_2$ and $ZnSnP_2$ gave relatively complex X-ray diffraction patterns. Both materials are semiconductors with energy gaps greater than 1 eV.

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Para-Localization Energy (Free-Electron Molecular-Orbital Method) and Polarographic Half-Wave Potentials of some Polynuclear Hydrocarbons

Polynuclear aromatic hydrocarbons in 75 per cent dioxane solution which contains 0·175 M tetrabutyl ammonium iodide are reducible in the dropping mercury electrode[1]. As shown by the corresponding polarograms, it is a two-electron addition step process, and it is similar to the reduction of these compounds by alkali metals or their amalgams and alcohol[2], a fact which can be easily explained.

Basu and Bhattacharva[3] suggested that, just as in chemical reduction, in the polarographic one the addition of two hydrogen atoms takes place in the *para*-positions. In this way, a relationship was established between *para*-localization energies, $P(-\beta)$, and the polarographic half-wave potentials, $-E_{1/2}$. Plotting $P(-\beta)$, calculated by Brown[4] using the molecular-orbital method, *versus* $-E_{1/2}$, determined by Wawzonek and Laitinen[1] for a number of polynuclear hydrocarbons, a good straight line was obtained[3].

However, certain objections can be raised. Actually, the value given by these authors to $P(-\beta)$ in the positions 1 : 4 of naphthalene is not 4·00, as has been stated, but 3·68 [4]. With the latter value the curve does not give a straight line. On the other hand, by plotting $P'(-\gamma)$ (corrected for overlap) against $-E_{1/2}$, a good straight line is obtained.

The *para*-localization energies for the hydrocarbons studied by Basu and Bhattacharva[3] have been calculated by us using the free-electron molecular-orbital method[5]; and we find that they differ from those calculated by Basu[6] in those compounds in which one of the residual molecules is ethylene. In fact, in our calculation of the π-electron energy of ethylene, we have supposed that the free-electron path terminates one bond-length beyond each end, obtaining for this energy 0·222 $h^2/8ml^2$, where l is the bond-length of this molecule. Table 1 summarizes the values of P calculated, and $-E_{1/2}$. The symbol K stands for $h^2/8ml^2 \approx 440$ kcal./mol. Plotting P against $-E_{1/2}$, a good straight line is obtained.

Table 1

Compounds	Positions	P	$-E_{1/2}$
Naphthalene	1 : 4	$2\alpha - 0{\cdot}173\,K$	2·50
Anthracene	9 : 10	$2\alpha - 0{\cdot}354\,K$	1·94
Phenanthrene	1 : 4	$2\alpha - 0{\cdot}153\,K$	2·46
1 : 2-Benzanthracene	5 : 10	$2\alpha - 0{\cdot}330\,K$	2·03
1 : 2,5 : 6-Dibenzanthracene	5 : 10	$2\alpha - 0{\cdot}308\,K$	2·07
Diphenyl	1 : 4	$2\alpha - 0{\cdot}092\,K$	2·70

It will be observed that our calculated P-values are in the right sequence compared with the $P'(-\gamma)$ values of Brown and the experimental values for the addition of maleic anhydride[4]. From our values it can be inferred that the *para*-localization energy must be less than $2\alpha - 0{\cdot}300\,K$, approximately, for the addition of maleic anhydride to take place. Our results also differ on this point from those obtained by Basu[6], who found that there is addition only when the *para*-localization energy is less than that of the energy (2α) of two isolated electrons. If we had calculated the ethylene energy supposing the box to extend only one half bond-length at each end, then the calculated *para*-localization energies, though differing numerically from Basu's[6], would have led us to expect addition only when they were less than 2α.

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Radioactive Contamination of Foodstuffs from Fall-out as a Source of Error in some Animal Experiments

The gastro-intestinal absorption of many substances may be determined by fæcal measurements following oral ingestion of a test dose containing a radioisotope. During the course of experiments of this type to determine the absorption of vitamin B_{12} in rats, it was noticed that residual radioactivity appeared in the excreta of control animals which had not been given the radioactive test dose. This radioactivity, which was first noticed in July 1956, has recently increased to an extent which makes it impossible to continue the experiments as originally designed.

The radioactivity was shown to result from a minute degree of contamination in the feeding stuffs and appeared as an 'excess' in the excreta collected for assay. The error was increased by the residual food inevitably mixed with the excreta in this type of experiment.

Table 1 gives the results of measurements of the activity of samples of rat cubes and some other common constituents of animal and human diet. All the measurements were made with a scintillation counter containing a sodium iodide crystal of 2 in. diameter and 1 in. long, a re-entrant container and