THE FORMATION OF AROMATIC HYDROCARBONS

AT HIGH TEMPERATURES.

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SUMMARY

Some of the problems associated with the mode of formation of aromatic hydrocarbons at high temperature have been investigated. A feasible route to the formation of 3:4-benzopyrene in tars involving, two, four, six, ten, and twenty carbon units has been taken as a working hypothesis. This mechanism presupposes that 3:4-benzopyrene may be found by pyrolysis of any of these supposed intermediate compounds. The pyrolysis of 1-4'-phenylbutynaphthalene (and related compounds), tetralin, and indene have been shown to contain 3:4-benzopyrene (together with twenty-five to thirty other compounds in the case of tetralin and indene), and a fraction of "Schroeter Tar", known to be strongly carcinogenic, has now been found to contain some 4% of 3:4-benzopyrene. These experiments, together with other very recent results in this field, have confirmed the suggestion that the most important reactions in pyrolytic synthesis involve cracking (with the formation of free radicals which then undergo further reaction), dehydrogenations, and cyclohydrogenations. However, the suggestion that diene synthesis also plays an important part has been shown to be most unlikely.