preliminary report of an examination of this method as it applies to benzene itself.

cycloPentane carboxylic acid, prepared by the carbonation of cyclopentyl magnesium chloride at − 30°, was reduced by lithium aluminium hydride[8] to cyclopentyl carbinol (b.p. 159–161° ; n_D^{21} 1·4567) in an overall yield of 81 per cent from carbon dioxide. Dehydration of the carbinol over activated alumina at 320° gave a mixture of unsaturated hydrocarbons which after hydrogenation over a nickel catalyst gave a 91 per cent yield of a mixture of methyl cyclopentane and cyclohexane (n_D^{20} 1·4149), shown by infra-red and refractive index measurements to contain approximately 30 per cent cyclohexane. This mixture was treated in a sealed tube at 75° during four hours with water-promoted aluminium chloride[6] ; the recovered hydrocarbon (98 per cent ; n_D^{20} 1·4228) contained 81·5 per cent cyclohexane. Selective dehydrogenation of the cyclohexane content of this mixture was carried out over a platinum-charcoal catalyst[9] at 350° ; in this way recoveries of better than 92 per cent of a product containing about 76 per cent benzene, 20 per cent methylcyclopentane and 4 per cent cyclohexane were obtained. The platinum–porous pot catalyst described by Berl and Koeber[10] gave satisfactory results with pure cyclohexane, but the presence of even a few per cent of methylcyclopentane markedly inhibited dehydrogenation of the cyclohexane present. Benzene was isolated from the mixture by formation of the clathrate compound with ammoniacal nickel cyanide solution[11,12]. The recovery of benzene from the above, and similar artificial mixtures, was about 89 per cent, the product having n_D^{20} 1·5011 and melting point 5·5°.

In this manner an overall yield of benzene from carbon dioxide of approximately 45 per cent has been obtained, which may be further improved by carrying out the aluminium chloride catalysed isomerization of methylcyclopentane at a lower temperature[7] for a longer time, and by recovering and recycling the cyclohexane and methylcyclopentane which do not react with ammoniacal nickel cyanide. A full account will be published elsewhere.

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Action of Dilute Sulphuric Acid on Magnetized Iron

FROM some observations on the chemical action of dilute sulphuric acid on magnetized iron, it has been stated[1] that, in addition to hydrogen, oxygen is present in considerable quantities, whereas with unmagnetized iron no such phenomenon occurs. We have investigated this further with an apparatus specially designed to exclude atmospheric oxygen and to prevent its subsequent diffusion into the materials. The results obtained with Swedish commercial iron indicated such an effect of the order of magnitude of only 10^{-3} to 10^{-4} by volume[2].

To narrow the limits still further, specimens of spectroscopically pure iron, first heated in an atmosphere of hydrogen and then degassed in vacuo, were allowed to react in a magnetized state. The gas analysis, performed with catechol – ferrous sulphate[3], gave colorimetrically a negative result, that is, an oxygen content certainly less than 10^{-6} by volume, which result was obtainable with unmagnetized specimens as well.

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Solidification Curves and Crystal Spacings of Binary Fatty-acid Mixtures

THE solidification curves of binary systems formed by adjacent even-numbered saturated fatty acids show, besides a minimum at about 73 mol. per cent of the lower-melting acid, an inflexion at the equimolar composition. To explain this departure from the Roozeboom classification of solid solutions[1], various investigators have assumed the formation of a compound by the two components of the system[2], an obvious assumption in view of the tendency of fatty acids towards association established by Robertson's cryoscopic studies[3]. However, compound formation has not been adequately verified by the results of X-ray measurements of fatty-acid mixtures, and Slagle and Ott[4], having found only one long crystal spacing d_1 instead of two d_1 spacings in mixtures other than equimolar, suggested a continuous series of solid solutions. The peculiar shape of the solidification curves of fatty acids was attributed by them to polymorphism.

During the present investigation, d_2 and d_3 short crystal spacings not reported hitherto for fatty-acid mixtures have been determined in addition to d_1 spacings in C_{12}–C_{14}, C_{14}–C_{16} and C_{16}–C_{18} acid-pairs, using a Philips Geiger X-ray spectrometer. Specimens were prepared by melting the samples on glass and rapid cooling. No changes of spacings due to polymorphism were observed. Single sharp values for d_1 spacings computed from third-order diffraction lines were obtained in each case ; but these values