93. *The Structure of Molecular Compounds. Part IX. A Compound of Xenon and Quinol.*

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The preparation of the compound of composition $3C_6H_4(OH)_2,0{\cdot}88Xe$ is described. The compound, similar in properties and structure to the corresponding argon and krypton compounds, contains 26% of xenon.

In Parts VII and VIII (*J.*, 1950, 298, 300) the preparation of compounds of quinol with argon and with krypton was described, and from consideration of the sizes of inert-gas atoms, which in these compounds are enclosed in a cage structure formed by hydrogen-bonded quinol molecules, it seemed probable that xenon would also fit into the cavity and thus form a similar compound.

The preparation was carried out in the manner previously described (Part VII) by cooling an aqueous solution of quinol in a pressure-vessel containing xenon. With the material available the highest pressure obtainable was 14 atmospheres. In these conditions the product obtained in the first experiment contained xenon but did not, as in the case of the argon and krypton compounds, contain large crystals suitable for separation by sieving or hand picking from any α-quinol present. From the loss of weight on heating it was found to have about one-third of the xenon content expected for the formula $3C_6H_4(OH)_2,Xe$. The product was not homogeneous and contained a small proportion of material of density greater than that of carbon tetrachloride but the bulk of it had a lower density. A second preparation gave 2 g. of product from which a few stumpy crystals of about 1 mm. diameter were separated by hand. Most of the product was then thrown into carbon tetrachloride and the main portion removed by flotation. About 0·1 g. of a dense fraction that sank in carbon tetrachloride was separated, and the xenon content determined. This part contained 26% of xenon [$3C_6H_4(OH)_2,Xe$ requires Xe, 28·5%]. The composition of the analysed sample may be represented as $3C_6H_4(OH)_2,0{\cdot}88Xe$, *i.e.*, 88% of the available cavities contain a xenon atom. The density of the hand-picked crystals was determined by flotation in mixtures of carbon tetrachloride and ethylene dibromide. The highest value observed was 1·69 g./c.c. The density calculated for the xenon compound, on the assumptions that it has the same unit cell dimensions as the argon compound and that all the cavities are occupied, is 1·77 g./c.c. The observed value corresponds to a composition $3C_6H_4(OH)_2,0{\cdot}84Xe$. The high density readily distinguishes the substance from the quinol compounds of argon or krypton, which have calculated maximum values of 1·42 and 1·59 g./c.c., respectively, and as prepared have somewhat lower values than those calculated.

The crystals are colourless and show no signs of decomposition after several days. On dissolution they liberate xenon, and, on heating, quinol volatilises and thus sets free xenon. A preliminary *X*-ray examination shows that they have a unit cell similar to those of the argon and krypton compounds.

The less dense fraction of the yield removed by flotation with carbon tetrachloride contained 10% of xenon. It may be a mixture but has not been examined in detail.

The author expresses his thanks to the British Oxygen Co., who prepared a suitable cylinder of xenon for this work.

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[*Received, November 15th,* 1949.]