

*A Continuous Flow Apparatus for the Purification of Impure Helium Mixtures.*¹

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(Read May Meeting, 1919.)

INTRODUCTION

The utilization of the absorbent property of cocoanut charcoal, cooled to a low temperature, introduced by Dewar² primarily for the production of high vacua and later for the separation of gases, has been practically the only laboratory method adopted for the isolation and purification of helium.

The usual practice is to admit impure gas gradually at low pressures to the charcoal contained in vessels immersed in liquid air and as soon as equilibrium is attained the unabsorbed helium is pumped off.

Ramsay³ made use of this method for the final purification of helium obtained by fractional distillation of liquid air and in his examination of the rare gases evolved from the mineral springs at Bath. It was used by Moureau and Lepape⁴ in their analyses of rare gases given off from French mineral springs, by Cady and McFarlane⁵ in work on the helium content of natural gases in Kansas, U.S.A., and by Professor J. C. McLennan and others in an investigation of the helium resources of the British Empire.⁶

Two hundred litres of helium prepared from monazite with which Professor Kammerling Onnes⁷ carried out determinations of isothermals—work which culminated in the liquefaction of helium—was purified by charcoal cooled in liquid hydrogen. Until recently the gas at Leiden constituted the greatest supply of pure helium existent,

¹ Communicated by Professor J. C. McLennan, F.R.S., by permission of the Admiralty.

² Dewar. *Proc. Roy. Soc.*, 1904. A 74, 122.

³ Ramsay. *Proc. Roy. Soc.*, 1905. A 76, 111.
Proc. Roy. Soc., 1908. A 80, 599.

Chem. News, 1912-105-134.

⁴ Moureau and Lepape. *Comp. Rend.*, 155, p. 197-1912.

⁵ Cady and McFarlane. *Jour. Amer. Chem. Soc.* 1907-29-1523.

⁶ Vide this Journal.

⁷ K. Onnes. *Proc. K. Akad. Wetensch Amsterdam*, 1908-11-168