

capsule in which the weighings are performed, and its weight ascertained. In transferring the coal from one vessel to the other, the larger pieces should be removed by a pair of fine brass forceps, and the little particles or dust afterwards swept into the weighing capsule by means of the camel's-hair pencil or small colour-brush belonging to the balance case. The weighing capsule should also be placed in the centre of a half-sheet of glazed writing paper, to prevent the risk of any accidental loss during the transference. After the weighing, the operation must always be repeated to ensure that no further loss of weight occur. In place of the blowpipe-lamp, the spirit-lamp may be employed for this operation, but with the former, there is less danger of the heat becoming too high. By holding a slip of glass for an instant, every now and then, over the capsule, it will soon be seen when the moisture ceases to be given off. It should be remarked, that some anthracites decrepitate slightly when thus treated, in which case the porcelain capsule must be covered with a small watch-glass.

*Estimation, &c., of Coke.*—In this operation, the small crucible is employed. Particles are detached from the assay specimen as before, by the cutting pliers, and about 100 or 150 milligrammes taken for the experiment. The weighing is performed in the crucible itself, this being placed in the little weighing-capsule, with its handle-support projecting over the side. The crucible, with its cover on, is then brought gradually before the blowpipe to a red heat. The escaping gases will take fire and burn for a few seconds on the outside of the vessel, and a small amount of carbonaceous matter may be deposited upon the cover. This, however, rapidly burns off on the heat being continued; and as soon as it disappears, the crucible is to be withdrawn from the flame, cooled quickly, and weighed always with its cover on. The loss, minus the weight of moisture as ascertained in a previous experiment, gives the amount of volatile or gaseous matter. The residue is the coke and its contained ash. The coke should be examined by a magnifying glass, and its general aspect and characters noted down. As already explained, some coals yield a swollen, semi-fused, and agglutinated coke, with a mamillated surface and metalloidal aspect. Others produce a slightly fritted and partially agglutinated coke; others again, an unfused coke retaining the form of the coal fragments subjected to the assay; others, a pulverulent, or a strongly-soiling coke, and so on. It is sometimes desirable to take the specific gravity of the coke.

*Estimation of Ash.*—The platinum capsule is employed for this operation. The coal must be reduced to a coarse powder, and about