

Question #73418, Chemistry / General Chemistry / Completed

A team of geologists has found a possible iron ore source, which happens to be magnetic. They have analysed a 1 kg sample of ore as follows:

The sample was crushed and passed over a magnetic belt to separate magnetite from the nonmagnetic residue. An amount of 345 g of magnetic ore was obtained. The non-magnetic residue was placed in a tank and underwent froth floatation. The lighter, copper-containing material floated while the heavier, silicon-containing material sank. 152 g of copper ore was extracted. Calculate the percentage composition of the original sample, with respect to iron ore and copper ore.

Solution

1000 g of the sample contains 345 g of Fe_3O_4 , 152 g of copper ore and 503 g of silicon residue. The percentage composition of the ore:

34,5 % Fe_3O_4 : 15,2 % copper ore : 50,3 % silicon materials.

The content of iron in the sample:

233.547 g of (Fe_3O_4) contains 3×55.85 g (Fe)

345 g of (Fe_3O_4) contains x g (Fe)

$x = 247.51$ g of Fe or about 24.75 %.

Answer: 34,5 % Fe_3O_4 : 15,2 % copper ore : 50,3 % silicon materials; 24.75 % of Fe.

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