

Oxygen determination in components made from copper and its alloys

Components made from copper or its alloys are mainly used in the electronic industry, as the thermal and electric conductivity of copper is superior compared to many other materials. During the production, up to 0.09 % of oxygen can be dissolved in the liquid copper melt. This leads to an embrittlement of the resulting components, which leads to mechanical instability and the local formation of copper oxides which also changes the material properties. Thus, the determination and control of the total oxygen content in copper and its alloys is crucial and should be monitored using an elemental analyzer.

The oxygen content of different copper materials was analyzed with the inductar EL cube in ONH mode. Additionally, the sulfur content was analyzed using the same instrument in CS mode. The samples were weighed into nickel capsules for O analyses and ceramic crucibles for S analyses using a sample weight between 500 mg and 1 g.

MATERIAL	O [%]	SD	S [%]	SD
control sample	0.0569	0.0001	0.0012	0.0002
raw material	0.5825	0.0310	0.0297	0.0041
1st cleaning stage	0.1232	0.0099	0.0015	0.0003
2nd cleaning stage	0.0327	0.0013	0.0020	0.0004

The results presented in the table above illustrate the high accuracy of the measurements, as well as the excellent reproducibility of the analyzer. By switching the inductar EL cube from the ONH mode to the CS mode, also the sulfur content can be determined. The easy conversion takes hardly more than 30 minutes and gives the user access to even more information about the sample.

INSTRUMENT:

inductar EL cube, ONH and CS mode

DETAILS:

carrier gas: helium (ONH), oxygen (CS)

sample: 500–1000 mg copper



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