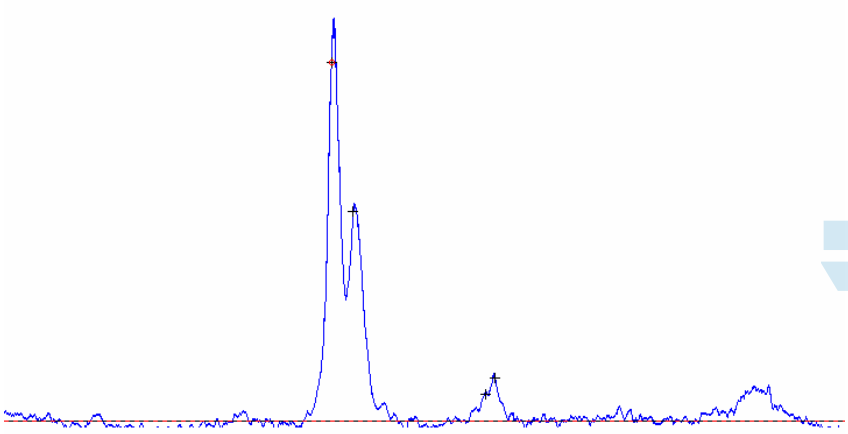
Metallurgy

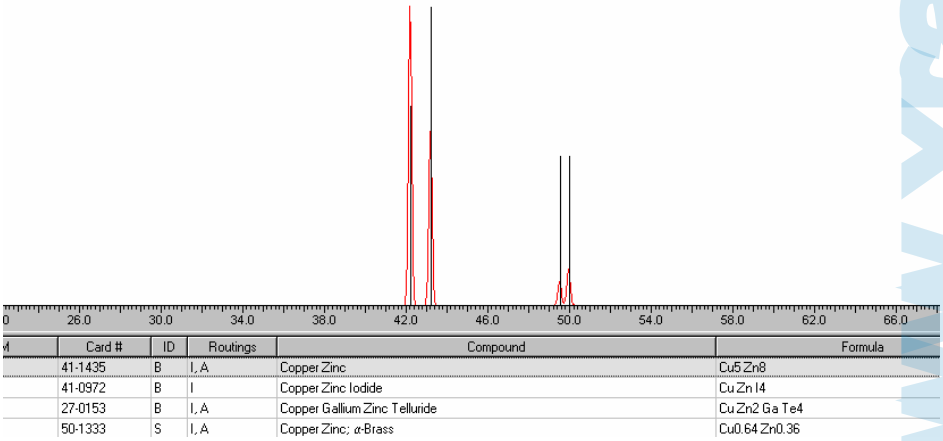
1. Phase Composition Analysis of Alloys

The composition of industrial brass of LS59-1 grade was analyzed.

A fragment of diffractogram

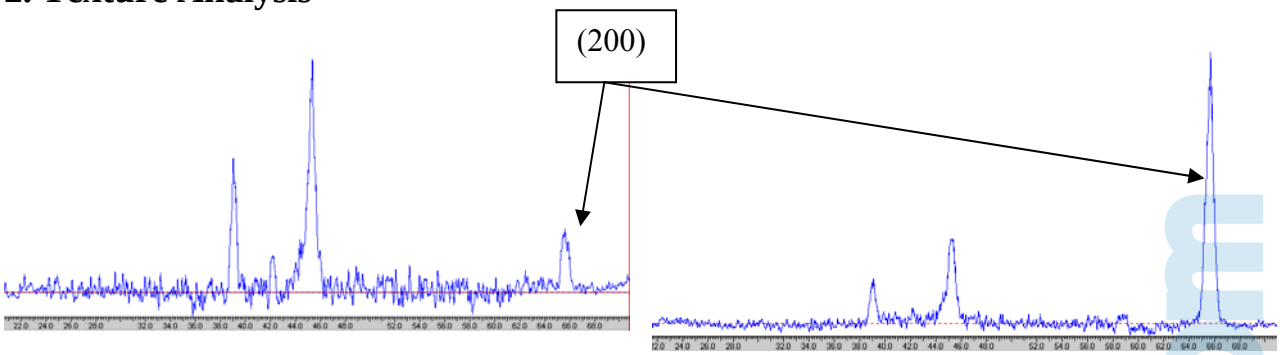


Window of the ICDD phase search program.
The alloy is correspondent to composition Cu5Zn8, with orthorhombic structure, lattice parameters: ***a***=5,11A ***в***=5,65A, ***c***=5.28A.



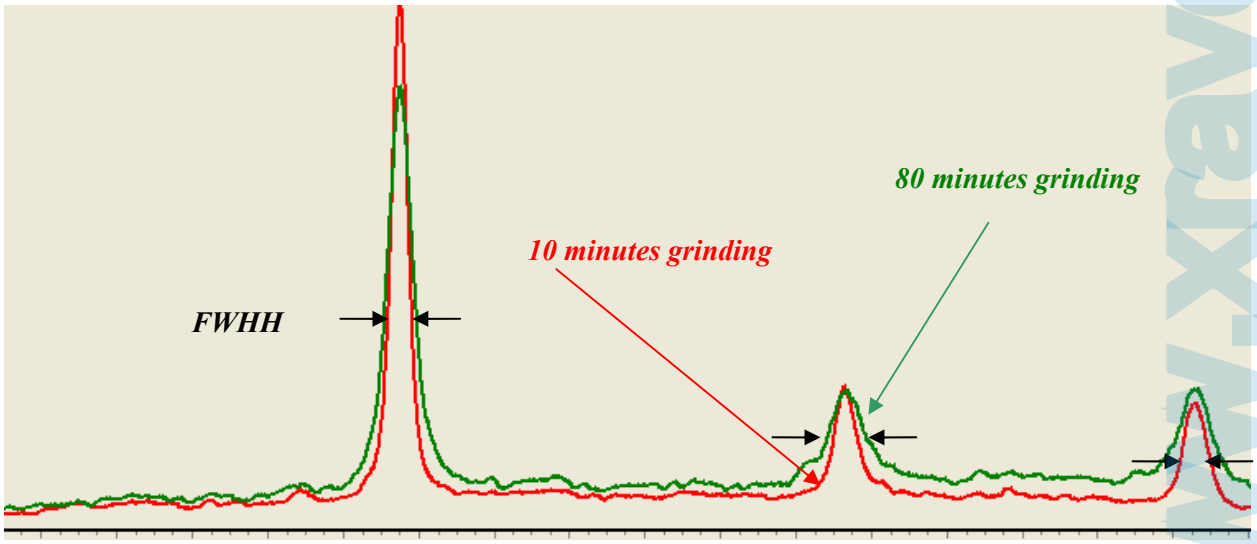
Card #	ID	Routings	Compound	Formula
41-1435	B	I, A	Copper Zinc	Cu5 Zn8
41-0972	B	I	Copper Zinc Iodide	Cu Zn I4
27-0153	B	I, A	Copper Gallium Zinc Telluride	Cu Zn2 Ga Te4
50-1333	S	I, A	Copper Zinc; α-Brass	Cu0.64 Zn0.36

2. Texture Analysis



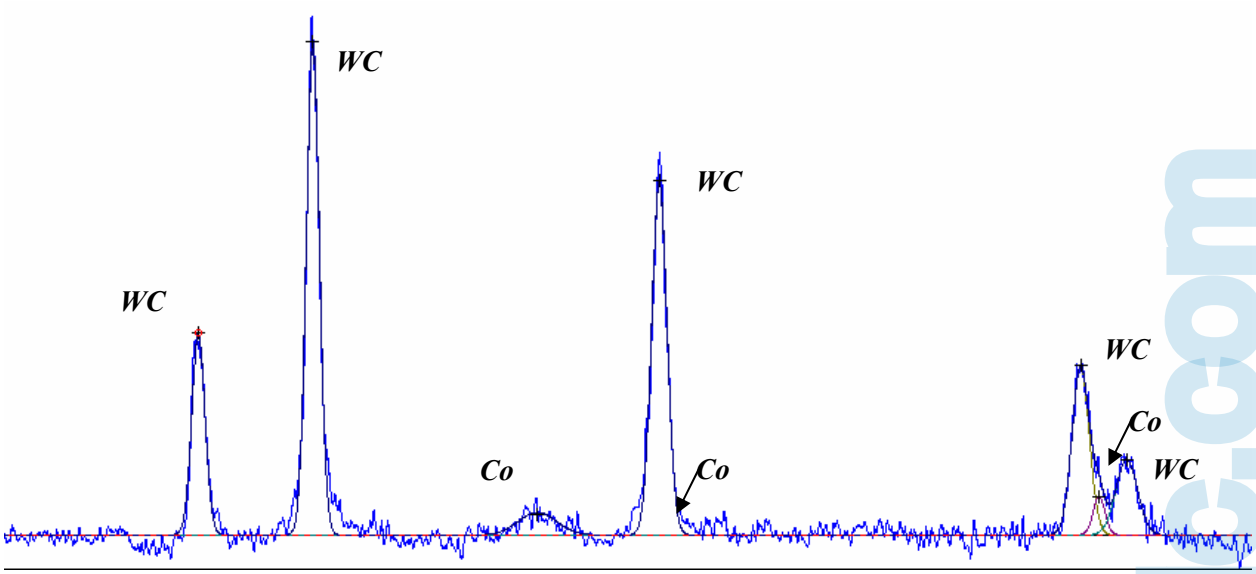
A typical diffractogram of Al rolled sheet with rolling texture in the direction [010]. When diffractogram was taken from the rolled aluminum sheet using the portable diffractometer in two perpendicular directions, a drastic difference in the intensities of lines in the rolling texture direction was observed.

3. Metal Powder Dispersion Analysis

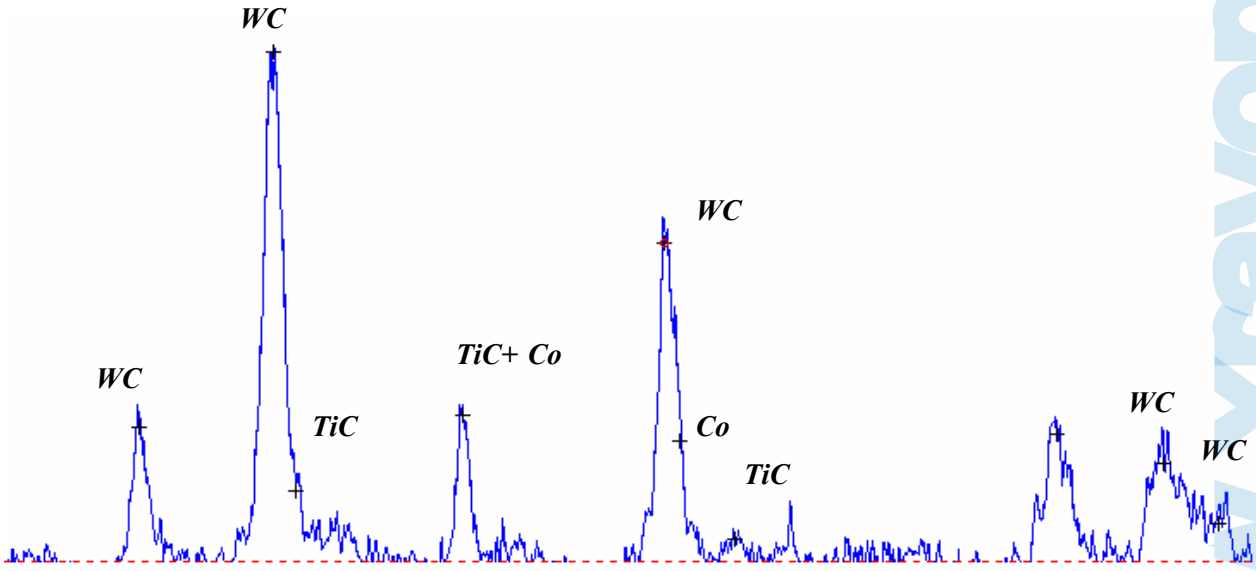


Nb was ground in high-energy ball grinder. Based on the width of the main lines, both grain value and dislocation density were assessed. In case of 80-minute grinding the coherent scattering regions had the value of the order of 9 nanometers, dislocation density was ~ 10^{12}cm^2. In case of shorter grinding (for 10 minutes), the lines are much narrower, which evidences much greater value of crystalline units and much smaller density of dislocations.

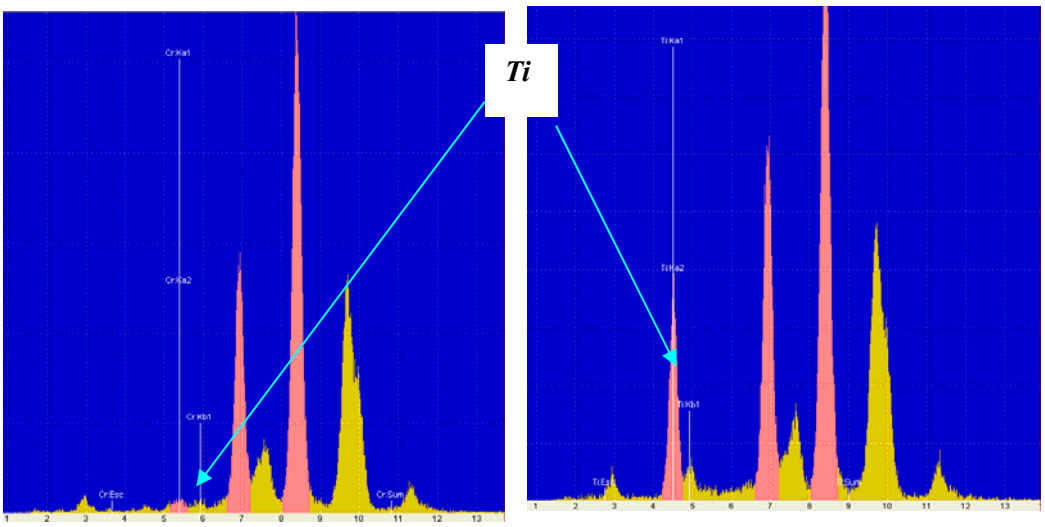
4. Inspection Check of Composite Materials' Composition



Composite material 8K8 consisting of particles of heat-resistant WC and ligament Co (8%).



Composite material T14K8 consisting of particles of heat-resistant carbides WC and TiC and ligament Co (8%)



A B

Elemental analysis of composite materials: A is BK8, B is T14K8