# Oxide identification by curve of gas dynamics

The analysis of oxide inclusions in metals is an important task in metallurgy, since different types of inclusions affect the properties of the metal in different ways.

## The problem

To develop a method for determining the rate of CO release from oxide inclusions in a sample during Fractional Gas Analysis and the sample composition.

## The method for metal oxide spectrum identification from non-isothermal gas dynamics

The idea of method is using a neural network from the DeepXDE package that takes into account physical information.

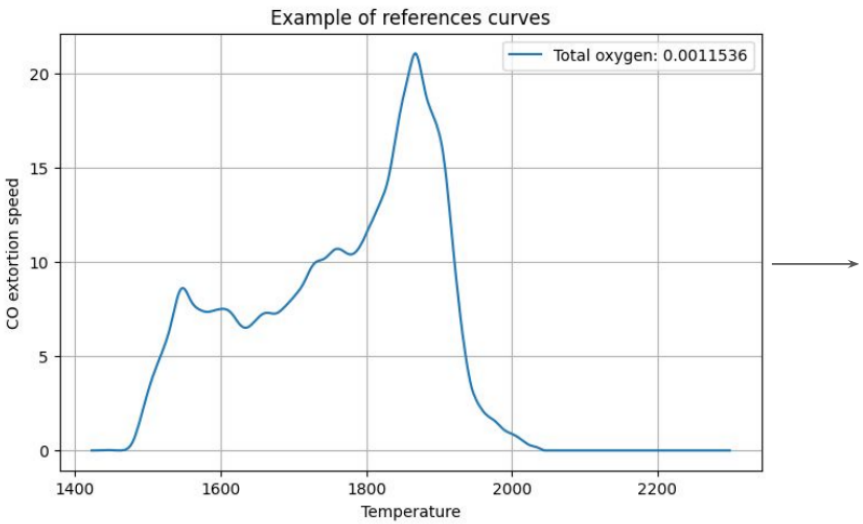
## The solution

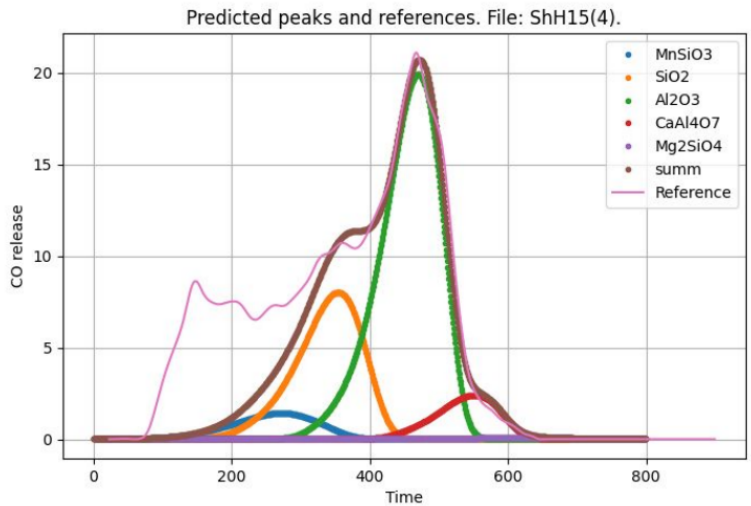
1) The required method has been developed.

2) The method has been tested on 2 types of bearing steel.

# The illustration of the method's[1] results

1) The first figure shows an example of a hologram obtained as a result of fractional gas analysis. This is a graph of the dependence of the rate of CO release on temperature.
2) The second graph shows the result of the method on the SHX-15. These are the predicted curves of the CO release rate, showing what inclusions there are in the composition of the metal.




[1] *Grigorovitch K. V., Krasovskii P. V., Krylov A. S.* Fractional Gas Analysis-Basic Principles and Application in Steel Quality, 1999.