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**UNCERTAINTY ESTIMATION FOR DETERMINATION C, SI, MN, S, P AND
CR IN LOW ALLOY STEEL BY OPTICAL EMISSION SPECTROSCOPY TO
PARTICIPATE IN PROFICIENCY TESTING SCHEME**

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ABSTRACT

Estimation of uncertainty in testing laboratories is the main effective parameter to achieve and declare the best measurement capabilities of the lab according to the requirements of ISO/IEC 17025: 2005 that states the general requirements for the competence of testing and calibration laboratories. Uncertainty also the base of evaluation the lab results when it participates in proficiency testing scheme according to ISO/IEC 17043:2010. In this research we estimated the uncertainty in detection procedure of C, Si, Mn, S, P and Cr in low alloy steel by Optical Emission Spectroscopy (OES). The required traceability to SI measurement units was achieved by using certified reference materials namely CRM 15259, CRM 187A, CRM 1761, CRM 187A, CRM BS14B and CRM 15259 that were produced according to ISO guide 34:2009. Results of the lab were evaluated in PT procedure by using z-score and robust mean standard deviation. The lab proficiency was found satisfactory z –score values when we used the proposed uncertainty estimation procedure.

Keywords: *Emission; steel and spectroscopy*