



MACEDONIAN UNION OF METALLURGISTS



**VIIIth INTERNATIONAL
METALLURGICAL CONGRESS**
METALLURGY, MATERIALS, ENVIROMENTAL (MME)

BOOK OF ABSTRACTS

30.05 - 03.06. 2018
OHRID, MACEDONIA



MACEDONIAN UNION OF METALLURGISTS

VIIIth International Metallurgical Congress,
**METALLURGY, MATERIALS
AND ENVIRONMENT**

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Ohrid, Republic of Macedonia

BOOK OF ABSTRACTS

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Perica Paunović, Sveto Cvetkovski & Goran Načevski

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- Electrochemistry, **E**
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**CONTRIBUTION TO THE ASSESSMENT OF THE STRUCTURE
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COMPOUND SPINEL AS A MASKING PIGMENT OBTAINED BY MECHANOCHEMICAL TREATMENT

Miroslav Sokić¹, Milan Petrov¹, Vladislav Matković¹, Ljubiša Andrić¹, Vaso Manojlović²,
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Mechanochemical and thermal treatment of metal oxides (Chromium, Cobalt, Zinc, Titanium, Magnesium, and Aluminum oxides) results in the formation of compound spinel with a formula $\text{Co}_{0.51}\text{Zn}_{0.29}\text{Mg}_{0.41}\text{Cr}_{1.24}\text{Al}_{0.24}\text{Ti}_{0.31}\text{O}_4$ – used as masking pigment. Such treatment of metallic oxides initiates a complex series of transformation using mechanical energy disturbing the arrangement of the crystal and molecular structure, as chemical and thermodynamic balance. With optical and scanning electron microscopy with EDX analysis, X-ray and chemical analysis of the resulting spinel – the quality, structure, grain size and color of the obtained spinel were determined. Also, the reaction surfaces, the resulting phase transformations, and the degree of formed dislocations and defects in the crystal lattice of the obtained spinel were determined. By the obtained results, the optimal conditions of the mechanochemical process have been designed, which involve the design the vibration mill (geometry, ceramic balls, and other), grinding time, the temperature in the mill, and rpm of the mill.

Key words: metal oxides, mechanochemical treatment, spinel, masking pigment

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