Investigating microhardness distribution between layers of multilayered steel materials

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The paper presents results of investigating microhardness distribution in mutilayered steels. Due to the fact that deviating from the normal distribution is one of the indicators of property inhomogeneity, we measured microhardness to obtain a data array for each layer of the binary composites under consideration, then processed the data to plot probability distribution histograms and studied the nature of probability distribution over any given layer. We determined that deviation from the normal distribution manifests as a bimodal microhardness distribution, meaning that there exist zones in which the chemical composition within a layer is not uniform. Since synthesising multilayered materials involves high temperatures and considerable total strain, we presume that these are the factors that affect diffusion-driven redistribution of alloying elements between layers. In order to confirm the hypothesis on redistribution of alloying elements, we conducted a thermal analysis; we also supply the results of analysing critical point positions in initial materials and multilayered composites synthesised out of these materials.

Keywords: *multilayered materials, microhardness, bimodal distribution, diffusion*

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