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**Structural and Mophological Studies of Precolombine Au-Based Craftsmanships** JAIRO ROA-ROJAS, JOSÉ HUMBERTO MOLINA ARANGUREN, National University of Colombia — We report crystallographic and morphological analysis of pre-Columbian craftsmanship for evaluation and restoration after 500 years of production by native artisan. Gold pieces of the pre-Columbian culture from the *andine* plateau were studied. Carefully Rietveld refinement of the X-ray diffraction patterns showed the characteristic Au structural phase, with incipient additional peaks, which correspond to non reactive Ni, Cr and Pt elements, to conform a microgranular composite. EDX spectrum reveals the presence of those elements and the semi quantitative analysis supplies values of 88% Au, 6% Ni, 4.5% Cr and 1.5 Pt. SEM show three well recognized types of grain: one majority obscure topology of 8 – 10  $\mu\text{m}$  grain size; second with slightly more brightness of grains, 3  $\mu\text{m}$  size; and a third kind of grains with mean size smaller than 3  $\mu\text{m}$ . These results were corroborated by using AFM studies. We interpret the first grain regime as corresponding to Au; second to Ni and Cr; and third to Pt. Similar mixture was prepared by utilizing Aldrich 99.99% precursors in order to perform the restoration of pre-Columbian pieces. The X-ray analysis of mixture showed the same behavior of initial studies of pieces.

Jairo Roa-Rojas  
Physics Department, National University of Colombia

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