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[\[PDF \(1092K\)\]](#) [\[References\]](#)**Determination of Surface Composition by X-ray Photoelectron Spectroscopy Taking into Account Elastic Photoelectron Collisions**[Aleksander JABLONSKI](#)¹⁾*1) Institute of Physical Chemistry, Polish Academy of Sciences*

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It is now well known that elastic photoelectron scattering in the surface region of solids cannot be ignored in the mathematical formalism of quantitative XPS. Elastic collisions may increase or decrease the photoelectron signal intensity, depending on the experimental configuration. Consequently, it is advisable to take into account these effects in calculations of the surface composition. In certain experimental geometries, the photoelectron intensity is practically unaffected by elastic scattering events (configurations defined by the so-called "Master Angle"), and in principle such geometries should be recommended for measurements. Unfortunately, they usually cannot be implemented in typical constructions of spectrometers. In the present paper, different procedures for estimating corrections for elastic scattering events are overviewed. The influence of these correction procedures has been illustrated on examples of AuAgCu and AuAgPdCu alloys. It turned out that elastic photoelectron collisions substantially decrease the signal intensities selected for analysis. However, they are diminished by roughly the same factor. As a consequence, the calculated surface composition is only slightly modified by the correction procedure. This effect may not be of general validity for all solids, and the algorithms for calculating the surface composition should have an option for including any elastic scattering effects. Further efforts are needed to improve the predictive formulas providing corrections for elastic scattering effects.

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