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Compositional Analysis of Microchannel Plates Using Energy-Dispersive X-ray Fluorescence Spectroscopy

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Modern microchannel plate detectors exhibit low quantum efficiency in the extreme ultra violet range (100-1000 Å) compared to those manufactured before 1990. The cause of this reduction in efficiency is unknown. We describe recent investigations into the variation of surface composition along the channels of a number of MCPs exhibiting high and low efficiency. These compositional profiles, generated using energy dispersive X-ray fluorescence spectroscopy, provide insight into the mechanisms underlying the observed reduction in quantum efficiency and may assist in efforts to restore the EUV performance of MCPs through modifications to the manufacturing process.

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