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ARTICLE

Cuprous sulfide deposition method for visualization of latent fingermarks on unfired cartridge cases

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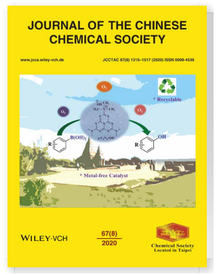
Abstract

A new chemical method for visualization of latent fingermarks on unfired cartridge cases is reported in this research. The method is based on two-step immersion of the cartridge cases in aqueous solutions of sulfuric acid and acidified sodium thiosulfate at room temperature. The chemical reactions that are occurring on the cartridge case's surface are leading to deposition of material in the furrows between the papillary line ridges thus visualizing the latent fingermark. The qualitative chemical composition of the as-deposited material was studied using X-ray powder diffraction analysis thus revealing that it corresponds to a low-crystalline hexagonal chalcocite phase cuprous sulfide (Cu_2S). The performance of the method was studied on fresh and aged fingermarks, and according to the results, it can visualize latent fingermarks that are up to 9 months old. The newly proposed method provides good performance considering the most important qualitative and quantitative parameters that describe each fingermark, that is, satisfactory contrast between the papillary line ridges and the background furrows, possibility of recognizing the pattern of each fingermark (arch, loop, and whorl), clarity and continuity of the friction ridges, and clarity of the second level characteristics and features. The proposed method is simple, fast, inexpensive, and reliable.

REFERENCES

Citing Literature



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