1. EXPLOSIVE EXAMINATION

A. Prior to analysis, suspected explosive evidence will be evaluated for potential safety hazards. If a safety hazard is suspected, the item should be handled in a proper and safe manner, refer to the pertinent section in Laboratory Services Bureau Safety Manual.

B. Explosive evidence can consist of single component high or low order explosives as well as mixtures of materials. Examination under low power magnification can reveal a mixture. If possible, the mixture should be physically separated, and the components individually examined.

C. Mixtures may also be separated by dissolution of the material into water and acetone. A sample of the evidence is washed separately with water and acetone. The solution(s) is/are then allowed to evaporate to dryness. Organic based explosives will be soluble in acetone; inorganic based explosives will be soluble in water.

D. The evidence is examined visually and the morphology of the material(s) is noted. Many low order explosives such as smokeless gunpowder, black powder, and black powder substitutes have distinctive morphologies.

E. If sufficient material is present a small portion (normally a few grains or small spatula tip) should be exposed to a flame to note the burning characteristics. Examination of suspected fuse should include (if sufficient length is available) a burning rate determination. These tests should be performed in a hood.

F. Color screening tests such as the nitrate/nitrite and ammonium ion test may be utilized to characterize the type of explosive.

G. A portion of the material can be analyzed using the Fourier Transform Infrared Spectrometer (FTIR). The questioned spectrum should be compared to spectra obtained from known standards or published library spectra.

H. A portion of the material can be analyzed for elemental composition using SEM/EDS. The spectrum obtained should be compared to that of a known standard when used to identify a specific explosive.

I. Unexploded materials may be identified at this point; some complex explosives are characterized by the identity of their components as well as the morphology of the components. For example, ammonium nitrate dynamites are characterized by the morphology of the ammonium nitrate prills, and the presence of nitroglycerine and/or ethylene glycol dinitrate, or a nitroparaffin.

J. Explosive conclusions should include the type of explosive and its classification (high or low explosive).

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