Chapter 6
Fire Investigation and Ignitable Liquid Residue Analysis

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ABSTRACT

A fire investigation is a difficult and challenging task. An investigator's basic task at a fire scene is two-fold: first, to ascertain the origin of the fire and, second, to closely investigate the site of origin and try to determine what triggered a fire to start at or near that spot. Usually, an investigation would begin by attempting to obtain a general view of the site and the fire damage; this may be achieved at ground level or from an elevated location. Following this, one may examine the materials available, the fuel load, and the condition of the debris at different locations. Surprisingly, the science of fire investigation is not stagnant, and each year, more information to assist investigators in determining the location and cause of a fire by diligent observation of the scene and laboratory study of fire debris is released. This chapter is split into two sections. The first section discusses the general procedures to be used during a fire investigation, and the second section discusses laboratory analysis of ignitable liquid residue analysis.

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PART 1

Fire Investigation

Fire investigation is the study of fire-related incidents using fire dynamics. When a tragic fire happens, experts must decide where and how the fire began, as well as whether it was accidental or deliberate. If the fire was started on intentionally, the investigator's results could lead to felony charges. If there were deaths as a result of the fire, an individual may be charged with murder.

If they suspect that a fire was lit deliberately, they want to see some signs of an ignitable liquid residue (ILR). Spotting the source of the fire allows the investigator to gather residue that could contain substances suggestive of, say, fuel or hydrocarbons that are trademarks of other ignitable liquids which can be used to cause fires.

INTRODUCTION

Prior to covering the subject of how a fire investigation is led, it is first important to comprehend how a fire examination is directed. This is the initial step of the logical methodology, depicted in National Fire Protection Association (NFPA) 921 as "Perceive the Need" (Reno et al., 2000). The principal assignment of most fire-fighting agents is to figure out the origin of the fire and how it started, yet the cause frequently has numerous more profound implications, contingent upon the unique situation. In case of notwithstanding the reason for a fire, one should comprehend the reason for fire demise. There may be a basic reason assurance, for example, an obvious and very common cooking fire, while investigating the cooking fire the following inquiry emerges "For what reason did the casualty neglect to get away from the fire area?", "Was there some kind of problem with the person in question?", "Is it safe to say that he or she was debilitated?", "Was there a major issue with the structure of the fire area?", "Whether the ways out were obstructed?", "Did the smoke caution function properly, and if not, why not?", "Did the fire spread excessively fast, and provided that this is true, why?" Fire specialists are frequently asked to decide for what good reason a fire spread in the manner that it did (Hall, 2006).

It is critical to arrive at the fire incident as soon as possible because it includes a variety of volatile substances such as fuel traces, smoke, eyewitnesses for questioning, and even the victim, and most notably, to preserve and protect the crime scenes from intrusive spectators.

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