

Using the ChemPro100i is as easy as 1-2-3

Gases & vapors are much harder to identify than solids and liquids

One often thinks that because FTIR and Raman have made it so simple to identify solids and liquids that it should be just as simple to identify gases and vapors. It is easier to identify solids and liquids because one is dealing with an inherently concentrated sample relative to gases and vapors. In solids and liquids the molecules are much closer together than in gases and vapors. This facilitates much quicker and easier identification of solids and liquids relative to gases and vapors.

It's easy to "hear" solids and liquids

The problem with gases and vapors is that, relative to solids and liquids, they are inherently less concentrated, so more work has to be done to get an identification. For sake of comparison, let's say that "identification" is when we are trying to hear the song that a number of people are singing. When we put all these people together then we can readily hear their song even from a distance. In this case, solids and liquids are kind of like the Mormon Tabernacle Choir. All the "voices" are packed together and we can "hear" them. That is, all of the molecules of the substance are packed together and we can readily identify them using FTIR or Raman.

It's much harder to "hear" gases and vapors

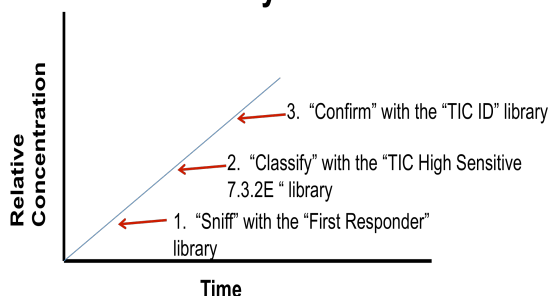
In the case of gases and vapors the molecules are much further apart so it is much harder to "hear" the chorus. In addition, it is more likely that a stray molecule of "something else" can wander in and disturb the signal by "singing a different song." We need to find levels of higher concentration to get a better idea of the song that most the molecules are singing. In the case of the ChemPro100i, the Trend screen (please reference TN-010) can be used to "find the singers." As we locate higher and higher concentrations using the Trend screen we can then "switch gears" on the ChemPro100i to increase selectivity by changing libraries.

Using the ChemPro100i to "hear the song"

1. We start with the ChemPro100i in the "Trend" screen in the broadband "First Responder" library which can alert to the greatest number of chemicals
2. Our first stop after we have located a region of higher concentration using the broadband "First Responder" library is to "change gears" to the "TIC-High Sensitive" library (also known as the "Classifier" library) which can help us differentiate our sample into "TIC Oxidizer," "TIC Hydride," "TIC Acidic" and other classes.
3. If we get a "TIC Oxidizer" alert on the ChemPro100i, and we suspect that it might be Chlorine, we can then shift gears again into the "TIC-ID" library. This will allow us to confirm that we have Chlorine present. Note that the "TIC-ID" library has a limited number of chemicals that it can confirm.

Gas and vapor identification can be difficult because the molecules are further apart. Using the Trend screen in the ChemPro100i one can locate the areas of higher concentration for more reliable classification and identification.

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