

## Tactical Considerations

Raman	FTIR
Scan through closed transparent container	Must open container
May generate heat in darker samples	Requires pressure
Does not see water	Sometimes confused or blinded by water
Better for water solutions	Good for all non-water liquids
Blinded by heat or dark colors (fluoresce)	Unaffected by color
Simple fuels and oils may fluoresce	Excels with simple oils and fuels
Cannot see metals (aluminum, iron, magnesium, mercury, zinc, etc.)	Cannot see metals (aluminum, iron, magnesium, zinc, etc.)
Cannot see elements (carbon or charcoal, iodine, phosphorous) Exception: sulfur	Cannot see elements (carbon or charcoal, iodine, phosphorous)
Cannot see ionic compounds. Names with two-words in this format: ...-ium ...-ide are suggestive of purely ionic compounds. Examples: <ul style="list-style-type: none"> <li>• Sodium chloride</li> <li>• Potassium hydroxide</li> <li>• Ammonium hydroxide</li> <li>• Calcium chloride</li> </ul> Notable exceptions: potassium cyanide, sodium cyanide	Cannot see ionic compounds. Names with two-words in this format: ...-ium ...-ide are suggestive of purely ionic compounds. Examples: <ul style="list-style-type: none"> <li>• Sodium chloride</li> <li>• Potassium hydroxide</li> <li>• Ammonium hydroxide</li> <li>• Calcium chloride</li> </ul> Notable exceptions: potassium cyanide, sodium cyanide
Cannot see purely ionic acids in water. Examples: <ul style="list-style-type: none"> <li>• Hydrochloric acid</li> <li>• Hydrofluoric acid</li> <li>• Hydroiodic acid</li> <li>• Sodium hydroxide (base)</li> <li>• Ammonium hydroxide (base)</li> <li>• Potassium hydroxide (base)</li> </ul> Consider pH test for all liquids without Raman signal. (red → acid; blue → base)	Cannot see purely ionic acids in water. Examples: <ul style="list-style-type: none"> <li>• Hydrochloric acid</li> <li>• Hydrofluoric acid</li> <li>• Hydroiodic acid</li> <li>• Sodium hydroxide (base)</li> <li>• Ammonium hydroxide (base)</li> <li>• Potassium hydroxide (base)</li> </ul> Some of these acids affect water, which might produce a result. Consider pH. (red → acid; blue → base)
Can see many complex anions in ionic compounds. Examples: <ul style="list-style-type: none"> <li>• Nitrate</li> <li>• Sulfate</li> <li>• Carbonate</li> <li>• Perchlorate</li> <li>• Chlorate</li> <li>• Cyanide</li> </ul>	Can see many complex anions in ionic compounds. Examples: <ul style="list-style-type: none"> <li>• Nitrate</li> <li>• Sulfate</li> <li>• Carbonate</li> <li>• Perchlorate</li> <li>• Chlorate</li> <li>• Cyanide</li> </ul>