



# TECH NOTES

## Melamine: Why is it a problem and how can we analyze it?

### A History:

**Melamine** is a chemical that has grabbed much attention in the last few years due to several cases of it being found as a contaminant in pet foods and infant formulas, but it's most common use today is in plastics. Many of the plastic products we use every day are made from Melamine Resin. It is rugged, flame resistant and applicable to many different products. The problem comes in its misuse.

**Melamine** in pet food: In March 2007 dogs and cats in the United States began to fall ill (some fatally) caused by Melamine contamination of pet foods. It was found the Melamine source was from wheat gluten imported from China. The wheat gluten was used to artificially increase the protein in the pet foods. Melamine contains high nitrogen levels and when added to the pet food it masked a false positive of high nitrogen, equating to high in protein. Therefore, the pet food products appeared to have more protein than it actually had.

**Melamine** in infant formula and eggs: In 2008 two incidents involving contaminated milk and eggs, both originating in China, had been adulterated with Melamine to again falsely raise the level of protein. It is estimated that nearly 300,000 people became ill in this case with approximately 50,000 infants being hospitalized and six infant deaths occurring. The eggs were contaminated through the feed the chickens ingested.

Studies have shown that even though Melamine has a low toxicity to mammals, on the same order as common table salt, it does become a problem when mixed with Cyanuric Acid which can occur naturally in food products. When Melamine and Cyanuric Acid mix, they form Melamine Cyanurate crystals which are nearly insoluble in water or bodily fluids. This occurs primarily in the kidneys, where the crystals form and block the excretion of urine, causing kidney damage. Melamine can also combine with Uric Acid, which is normally found in urine, and form kidney stones which can also cause major health problems.

### The Response:

In October 2008 the US Food and Drug Administration (FDA) issued new methods for Melamine and Cyanuric Acid analysis in Laboratory Information Bulletins. Since then the FDA has developed methods utilizing GC/MS for screening, or for lower detection limits HPLC MS/MS. Additionally, there have also several methods developed by analytical instrument manufacturers for their respective equipment. Pet food, animal tissue, and milk are among the matrices listed in the published methods.

Because of demand in the chemical industry, **McCoy and McCoy Laboratories, Inc. (MMLI)** developed a method for analyzing polymers used in the food, drug, and cosmetic industries that is based on FDA methods contained in LIB No. 4421 and LIB No. 4422, along with information contained in a method published by Applied Biosystems. For more information, contact **Doug Wolfe, Director of Compliance & Development at 270.821.7375 x: 102** or any of our Marketing Representatives.



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