

Assembly Study of Melamine and its Derivatives

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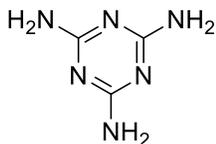
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Editorial

Melamine is well established nitrogen rich triazine ring containing molecule with three additional nitrogen atoms those can easily protonate and enhance the solubility of polar solvents [1].

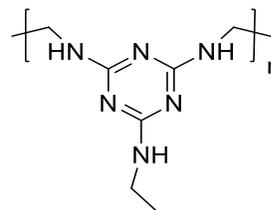
Figure (1): Structure of melamine.



Recently, derivatization of melamine gained the significant advanced for variety of purposes including corrosion inhibition. Literature survey revealed that melamine and its several derivatives have been investigated as effective corrosion inhibitors for metals and alloys in aggressive solutions owing to their high protection ability which is in turn

attributed to the adsorption of these compounds by their protonizable amino groups and non-bonding electrons of nitrogen atoms and π -electrons of three double (-C=N-) bonds [2,3]. Melamine is a nontoxic, white, odourless hetero-aromatic substance, which is used as a raw material for various industrial products, mostly as a high-molecular weight compound obtained from reaction with formaldehyde. Melamine-formaldehyde (MF) resins are obtained by poly-condensation of melamine with formaldehyde in acidic or basic media [4].

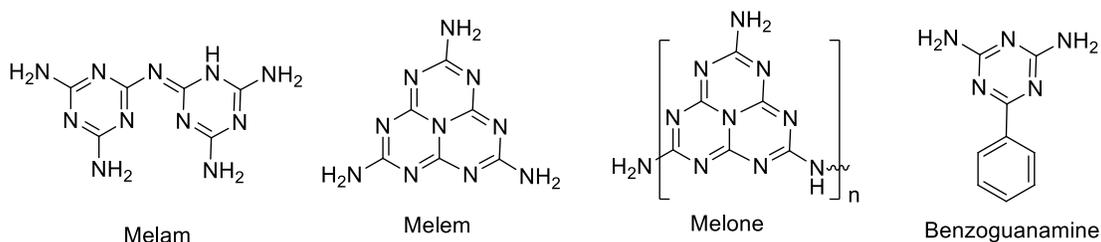
Figure (2): Melamine formaldehyde (MF).



Melamine may be partially or totally replaced with other suitable amine containing compounds. Alternatives to melamine include urea, thiourea, dicyandiamide, 2,5,8-triamino-1,3,4,6,7,9,9b-heptaazaphenalene (melem),

(N-4,6-diamino-1,3,5-triazin-2-yl)-1,3,5-triazine-2,4,6-triamine (melam), melon, ammeline, ammelide, substituted melamines, and guanamines [5].

Figure (3): Melam, melem, melon and benzoguanamine



The melamine homologs melam, melem, and melon have higher thermal stability than pure melamine. These compounds are also used as flame retardants.

Because of the high nitrogen-content, some fraudulent companies use melamine into the dairy products to show the high protein contents in their products. It also increases

the nitrogen concentration in milk producing in a false appearance of a higher level-protein by the Kjeldahl method [6], especially pet foods [7]. In 2007, melamine adulteration in pet foods resulted in the death of hundreds of cats and dogs in the USA [8]. Since then, attention has been paid to monitoring exposure to melamine in pets.

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