Study Guide

Module 408 – Level 4

Acrylic and Amino Resins

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Summary

In this Intermediate Level Module thermoplastic and thermosetting acrylics are described. The monomers used to make these resins are listed, and the significance of monomer choice on polymer hardness is shown.

Of importance are the precaution that must be taken in handling and storage of acrylic monomers and these are given. The preparation of an acrylic resin is outlined, and a typical plant to carry this out is illustrated.

Also described is the manufacture of amino resins, their chemical structure and some of their uses.

Structure of the Module

The module training material consists of 2 sections, 1 set of Self-Assessment Questions (SAQ), 1 Computer Marked Assessment Questions (CMA), 2 Tutor marked Assignments (ASG), and a final Tutor Marked Assessment (TMA).

The module is designed to take about 8 hours of study. This excludes the time taken to write up the reports for the ASG's.

Self-Assessment Questions (SAQ)

Are designed to enable you to check your own progress. Questions are asked as you progress through the module. You should write down your answers and then check them against the answers given in the Appendices. No marks are awarded for SAQs.

Computer Marked Assessment Questions (CMA)

Are a multi-choice question set that tests your understanding of the module. Please carry out this test before you submit any other work for marking by your tutor. These are completed online, you will need to log onto your study portal and then follow the CMA link/ instructions.

Assignment (ASG)

The ASG are an exercise in which the student research into and reports on certain objectives. You can discuss your proposed assignment with your tutor and mentor before commencing work. You will need to write a report on the assignment, which is then sent to your tutor for marking. Please see further instructions included in the Appendix on ASG Guidance Notes. Please note that there are 2 ASG's in this module.

Tutor Marked Assessment (TMA)

Is a mandatory end test question paper taken under 'closed books', fully invigilated exam conditions. These are normally held on-site with an invigilator in attendance, which is normally your workplace mentor. The student or mentor will contact Lorraine Beard, and she will arrange

for the TMA and instructions to be sent, by email to the chosen invigilator, and then this is then given to the student on the day and time that has been chosen.

Marks for the module

CMA	20%
ASG	35%
TMA	45%
	100%

An overall mark of 50% or more is necessary for successful completion of the module, with students achieving at least 40% of the marks available in each element. In addition, an overall mark of 50% - 64% must be achieved for a PASS to be awarded, an overall mark of 65% - 84% must be achieved for a Merit and over 85% for a Distinction.

Module Pre-requisites

These modules include references to scientific concepts relating to coatings technology. For example, those identified with an asterisk contain many references to chemical formulae and reactions. Therefore, it is a requirement that you have a scientific education, with Chemistry and Physics to at least UK Advanced Level or higher, of which you can provide evidence.

Overview of qualification levels

Persons taking these modules should be employed or have recently been employed in the coatings or a related industry.

Most intermediate students will have studied some modules at foundation level. However, students who have not studied modules at foundation level but have a scientific background and experience of the coatings industry should be able to benefit from this module.

Successful completion of six modules, including at least four at level 4 entitles a student to a full, Level 4 International Certificate in Coatings Technology (ICCT), awarded by The Coatings Training Institute. However, individual certificates are also presented if the student chooses to take less than six modules.

Persons taking modules at Intermediate Level should be employed or have recently been employed in the coatings or a related industry. They should have studied some science and chemistry.

Module Objectives

When you have finished this module, you should be able to understand the following:

SECTION 1 – ACRYLIC RESINS

1.1 State that the prime property of acrylic resins is their excellent light stability

1.2 List the monomers used in the preparation of acrylic resins.

1.3 Be aware of the hazards in handling and storage of acrylic monomers

1.4 Predict the effect of monomer choice on polymer hardness

1.5 Describe the preparation of a typical thermosetting acrylic resin

SECTION 2 – AMINO RESINS

2.1 Describe amino resins as etherified urea or melamine formaldehyde polymers

2.2 Explain the reaction of urea and melamine with formaldehyde and subsequently the etherification with an alcohol

2.3 Describe the chemical structure of amino resins

2.4 Explain why amino resins cannot be used as the sole film formers