

PART A / BAHAGIAN A

- (1). (a). How to determine the tensile properties and residual powder in natural rubber latex gloves?

Bagaimana menentukan sifat tensil dan sisa serbuk dalam sarung tangan lateks getah asli?

(10 marks/markah)

- (b). Well preserved field latex will have a typical mechanical stability time (MST) minimum value of 650s. The latex received from TY Latex Sdn Bhd showed the MST value of 700s.

Lateks ladang yang diawetkan dengan baik akan memberikan nilai minimum masa kestabilan mekanikal (MST) ialah 650s. Lateks yang diterima daripada kilang TY Latex Sdn Bhd menunjukkan nilai MST ialah 700s

- (i). Explain the importance of the MST obtained towards the quality of received latex and suggest how to increase the latex colloid stability.

Jelaskan kepentingan MST yang diperolehi terhadap kualiti lateks yang diterima dan cadangkan cara untuk meningkatkan kestabilan koloids lateks tersebut.

...3/-

- (ii). If the received latex from TY Latex Sdn Bhd is used in your latex compounding, predict what will be expected during the compounding process and the obtained mechanical properties of the latex films.

Jika lateks yang diterima dari TY Latex Sdn Bhd digunakan dalam penyebatian lateks anda, jangkakan apa yang akan berlaku semasa proses penyebatian dan kekuatan mekanikal filem lateks yang diperolehi.

(10 marks/markah)

...4/-

PART B / BAHAGIAN B

- (2). (a). Top Latex (M) Sdn. Bhd received three samples of latex from the suppliers with the characteristics:

Top Latex (M) Sdn. Bhd menerima tiga jenis sampel lateks dari pembekal yang mempunyai ciri-ciri berikut:

- (i). Field latex with 0.2% ammonium content
Lateks ladang yang mengandungi 0.2% ammonia

- (ii). Old stock of HA latex stored in an airtight container for 2 years.
Lateks HA lama yang disimpan dalam bekas kedap udara selama 2 tahun.

- (iii). New LA latex
Lateks LA baru

As a compounding engineer, explain how you can differentiate all the samples.

Sebagai jurutera penyebatian, jelaskan bagaimana anda dapat membezakan semua sampel ini.

(12 marks/markah)

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- (b). If the latex received is used to produce latex compound, predict the expected problem to occur during the compounding and dipping process.

Jika lateks yang diterima digunakan untuk menghasilkan sebatian lateks, jangkakan apakah masalah yang mungkin berlaku semasa proses penyebatian dan pencelupan.

(8 marks/markah)

- (3). (a). Provide the formulation to produce orange Natural Rubber latex compound with identification of the classification and function of each compounding ingredient used.

Berikan formulasi untuk menghasilkan sebatian lateks getah asli berwarna jingga dengan mengenalpasti klasifikasi dan fungsi setiap ramuan penyebatian yang digunakan.

(10 marks/markah)

- (b). Discuss the repulsive forces that exist in between latex particles that give colloidal stability to natural rubber latex. Based on your understanding, explain how the chemical agent can destabilize the latex colloidal stability.

Bincangkan tenaga-tenaga penolakan yang wujud antara partikel-partikel lateks yang memberikan kestabilan koloid bagi lateks getah asli. Berdasarkan kefahaman anda, jelaskan bagaimana agen kimia boleh penyahstabil kestabilan koloid lateks.

(10 marks/markah)

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- (4). (a). Briefly describe the preparation method of sulphur pre-vulcanized natural rubber latex compound at 70°C. Based on your knowledge, suggest a suitable method to assess the degree of optimum vulcanization of the prepared compound.

Bincangkan secara ringkas langkah-langkah penghasilan pra-pemvulkanan sulfur bagi sebatian lateks getah asli pada 70°C. Berdasarkan pengetahuan anda, cadangkan kaedah yang sesuai bagi mengukur darjah pemvulkanan optima bagi sebatian yang disediakan.

(12 marks/markah)

- (b). Illustrate theories that explain the mechanism of film formation for pre-vulcanized natural rubber latex and suggest the suitable theory for starch-filled natural rubber latex films.

Gambarkan teori-teori yang menerangkan mekanisme pembentukan filem lateks getah asli pra pemvulkanan dan cadangkan teori yang sesuai bagi filem lateks getah asli terisi kanji.

(8 marks/markah)

...7/-

PART C / BAHAGIAN C

- (5). (a). Why is the chemical resistance property of latex gloves important?
How to determine the chemical resistance of nitrile gloves?

*Kenapa sifat rintangan kimia bagi sarung tangan lateks penting?
Bagaimana menentukan rintangan kimia bagi sarung tangan nitril?*

(10 marks/markah)

- (b). How to detect pinholes in synthetic latex gloves? Why is the detection of pinhole so important?

Bagaimana mengesan "pinhole" dalam sarung tangan lateks sintetik? Kenapa pengesanan "pinhole" begitu penting?

(10 marks/markah)

- (6). (a). Compare the surface modification of latex gloves between coating with powder and coating with hydrogel materials.

Bandingkan pengubahsuaian permukaan sarung tangan lateks di antara penyalutan serbuk dengan penyalutan bahan hidrogel.

(10 marks/markah)

- (b). Discuss how to produce latex thread with high thermal stability. The discussion must be supported by a suitable flow chart.

Bincangkan bagaimana menghasilkan bebenang lateks yang mempunyai kestabilan terma yang tinggi. Perbincangan mesti disokong dengan carta aliran yang sesuai.

(10 marks/markah)

...8/-

- (7). (a). What is nitrosamine? Suggest how to solve the nitrosamine problem.

Apakah itu nitrosamine? Cadangkan bagaimana menyelesaikan masalah nitrosamine.

(10 marks/markah)

- (b). What are extractable proteins? How to measure the extractable proteins content?

Apakah itu protein terekstrak? Bagaimana mengukur kandungan protein terekstrak?

(10 marks/markah)

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