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TRIAL PRODUCTION OF CONDOM FROM IRRADIATED NATURAL RUBBER LATEX IN FACTORY SCALE

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ABSTRACT

TRIAL PRODUCTION OF CONDOM FROM IRRADIATED NATURAL RUBBER LATEX IN FACTORY SCALE. Irradiation of latex was carried out using gamma rays from ^{60}Co at 20 kGy in the presence of 1 phr (part hundred ratio of rubber) of normal butil acrylate (nBA), and 1 phr of carbon tetrachloride (CCl_4). A straight dipping process for producing condom with various processing condition, i.e. total solid content of irradiated latex (50, 51, 52%), and speed of production (45, 46, 47 gross/hour) was applied. The results show that by increasing total solid content or speed of production, the thickness and weight of condom increase. Condom from irradiated latex has low modulus, high elongation at break and high bursting volume. The condom from irradiated latex can satisfy the standard requirement.

ABSTRAK

UJI COBA PEMBUATAN KONDOM LATEKS ALAM IRADIASI DALAM SKALA PABRIK. Lateks alam yang diiradiasi dengan sinar gamma ^{60}Co pada dosis iradiasi 20 kGy dengan menggunakan 1 psk (per seratus bagian berat karet) normal butil akrilat (nBA) dan 1 psk karbon tetraklorida (CCl_4), digunakan dalam percobaan ini. Beberapa kondisi proses pencelupan secara langsung untuk memproduksi kondom yaitu kadar padatan (50, 51, dan 52%), dan kecepatan produksi (45, 46, dan 47 gros/jam) telah dicoba. Hasilnya menunjukkan bahwa dengan naiknya kadar padatan dan kecepatan produksi, tebal dan berat kondom meningkat. Kondom dari lateks alam iradiasi mempunyai modulus rendah, perpanjangan putus tinggi dan daya rekat tinggi. Kualitas kondom lateks alam iradiasi memenuhi persyaratan standar.

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INTRODUCTION

It has been reported earlier that radiation vulcanization of natural rubber latex can be sensitized by normal butil acrylate (nBA) and carbon tetrachloride (CCl_4). The irradiated latex can be used for producing rubber goods, such as ballon, and industrial gloves (1-3).

Several scientists reported that RVNRL or irradiated natural rubber latex is not cytotoxide and free from nitrosamines (4-5), so irradiated natural rubber latex will be an alternative to conventional basic substance especially for the production of consumer goods being in contact with human body, such as surgical gloves, and condom.

A condom plant in Indonesia is in operation since 1987. The designed capasity of this plat is 900.000 gross/year, using three lines of molding systems (6).

This paper presents the results of trial production of condom from irradiated natural rubber latex in factory scale, for preparation of commercial production of condom from irradiated latex.

EXPERIMENTAL

Materials. High ammonia type centrifuged natural rubber latex from Pasir Waringin Rubber Plantation. PTP XI, West Java, Indonesia was used (Table 1). Carbon tetrachloride and normal butil acrylate were used as sensiti-