Karakteristik degradasi campuran vulkanisat karet alam dan karet nitril (NR/NBR) oleh dimetil eter melalui variasi ratio elastomer = Characterized degradation of blending vulcanized natural rubber and nitril rubber (NR/NBR) by dimethyl ether through variation of elastomer ratio

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Abstrak

Dewasa ini, telah hadir beragam energi terbarukan untuk mensubtitusi energi fosil sebagai bahan bakar kendaraan bermotor, salah satunya ialah dimetil eter. Dimetil eter merupakan bahan bakar langsung maupun campuran untuk bahan bakar khususnya pada mesin diesel. Seperti halnya gasoline, dimetil eter dapat menyebabkan degradasi swelling material seal pada bagian mesin diesel. Material seal yang umum digunakan ialah karet nitril NBR yang tahan terhadap kontak dengan hidrokarbon dan juga unggul sifat fisiknya. Dalam rangka memanfaatkan penggunaan karet alam didalam industri otomotif, peneliti melakukan campuran karet alam NR dan karet nitril 33 acrylonitrile NBR33 untuk menghasilkan karet yang memenuhi standar aplikasi material seal.. Penelitian ini akan meneliti mekanisme yang terjadi pada degradasi campuran karet alam dan karet nitril NR/NBR33 oleh dimetil eter. Variasi campuran vulkanisat karet NR/NBR33 yang digunakan secara berurutan yaitu 1:3, 1:2, 1:1, 2:1, 3:1 Metode untuk mengetahui mekanisme tersebut meliputi karakterisasi mekanis mencangkup: perubahan massa, kekuatan tensile, elongasi maksimum, kekerasan dan karakterisasi morfologis dengan pengamatan morfologis menggunakan Scanning Electron Microscopi SEM . Data penelitian menunjukkan bahwa setiap variasi sampel campuran vulkanisat mengalami peristiwa degradasi swelling dan dissolution. Peningkatan rasio karet nitril NBR33 pada vulkanisasi campuran karet dapat mengurangi penurunan tensile strength dan elongation hingga melampaui sifat fisik sebelum perendaman oleh dimetil eter. Dengan demikian, variasi elastomer terbaik diperoleh setelah membandingkan dengan standar kelayakan material seal yakni campuran vulkanisat karet NR/NBR33 dengan rasio 40 : 60 NR : NBR.

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Today, there is present a variety of renewable energy to substitute fossil energy as a fuel for motor vehicles, one of which is dimethyl ether. Dimetl ether is a direct fuel or a mixture of fuel, especially diesel engines. In addition, dimethyl ether also has met the standard criteria for renewable energy. Semelsberger et.al., 2005 . As with gasoline, dimethyl ether can cause swelling degradation of the material seal on the diesel engine. Seal material that is commonly used is a nitrile rubber NBR that is resistant to contact with hydrocarbons and also superior physical properties. In order to make use of natural rubber in the automotive industry, researchers conducted a blending of natural rubber NR and nitrile rubber NBR to produce rubber meets the standard seal material application .. This study will examine the mechanisms that occur in the relegation blending natural rubber and nitrile rubber NR NBR by dimethyl ether. Nitrile rubber types used medium quality nitrile rubber with acrylonitrile content of 33 NBR33 . Methods to determine the mechanism includes mechanical characterization covers change in mass, tensile strength and maximum elongation, hardness and morphological characterization with morphological observations using Scanning Electron Microscopic. Observations of this study is limited which is to see the effect of variation vulcanized blending

ratio NR NBR33 against degradation swelling. Variations blending vulcanized NR NBR33 are used in a sequence that is 1 3, 1 2, 1 1, 2 1, 3 1. The results of this research is to determine the most optimal value ratio elastomer that is resistant to swelling degradation depend on physical and structural changes. The increase nitrile rubber NBR33 ratio of blending rubber vulcanized can reduce the decrease of tensile strength and elongation until exceed physical properties before immersion with dimethyl ether. Thus, the best elastomer variation was obtained after comparing with the standard feasibility material of seal is rubber vulcanized blending NR NBR33 with ratio 40 60 NR NBR.