Kajian literatur sistematis upaya pengendalian nanomaterial di tempat kerja = Systematic literature review of nanomaterial hazard control at workplace

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Abstrak

Penelitian ini bertujuan untuk menjelaskan mengenai upaya pengendalian pajanan bahaya nanomaterial di tempat kerja berdasarkan hierarki pengendalian. Studi dilaksanakan mulai bulan Januari 2022 sampai dengan Juni 2022 dengan menggunakan metode kajian literatur sistematis (systematic literature review). Literatur yang digunakan berupa jurnal atau buku yang dipublikasikan dalam rentang 10 tahun terakhir. Literatur didapat dari pangkalan data internasional daring (online database). Dari hasil kajian terhadap 14 (empat belas) literatur terpilih ditemukan bahwa upaya pengendalian nanomaterial dilakukan melalui tiga metode, yaitu rekayasa teknik, pengendalian administratif, dan penggunaan alat pelindung diri. Metode upaya pengendalian rekayasa teknik yang spesifik untuk nanomaterial adalah nano-specific fume hood, tetapi pada saat ini desainnya masih dikembangkan dan perlu penelitian lebih lanjut. Metode pengendalian administratif untuk nanomaterial misalnya penggunaan SDS yang di dalamnya harus tercantum informasi mengenai karakteristik fisikokimia nanomaterial, ekotoksikologi, toksikologi, dan manajemen situasi darurat dan bencana. Sementara itu, alat pelindung diri yang direkomendasikan ketika menangani nanomaterial adalah protective clothing berbahan nonwoven high-density polyethylene textile fabric, gloves berbahan nitril dengan ketebalan 0.11-0.15 mm, respirator tipe EHR, dan lainnya. Pemilihan upaya pengendalian yang tepat untuk tempat kerja dilakukan berdasarkan beberapa kriteria, seperti hasil penilaian pajanan, biaya (capital cost dan operating cost) dan efektivitas kontrol yang bervariasi antarmetode pengendalian.
.....This study aims to explain the control of nanomaterial hazards in the workplace based on hiearchy of controls. The study was conducted from January 2022 to June 2022 using systematic literature review method. The literature used are journals or books published in the last 10 years. The literature was obtained from online databases. From the results of a study of 14 (fourteen) selected literatures, it was found that nanomaterials control were carried out through three methods: engineering control, administrative control, and personal protective equipment. A specific engineering control method for nanomaterials is a nano-specific fume hood, but the design is still being developed and needs further research. Administrative control methods for nanomaterials is SDS which should include information on the physicochemical characteristics of nanomaterials, ecotoxicology, toxicology, and emergency and disaster situation management. Personal protective equipment that is needed are protective clothing with high density non-woven polyethylene textile fabrics, gloves made of nitrile with a thickness of 0.11-0.15 mm, EHR-type respirators, etc. The selection of appropriate control measures for the workplace is carried out based on several criteria, such as the results of exposure assessment, capital cost and operating cost, and the effectiveness of controls that vary between control methods.