

Analysis of Human Toxicity Potential of Major Building Material Production Stage Using Life Cycle Assessment

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Abstract : Global environmental issues such as abnormal weathers due to global warming, resource depletion, and ecosystem distortions have been escalating due to rapid increase of population growth, and expansion of industrial and economic development. Accordingly, initiatives have been implemented by many countries to protect the environment through indirect regulation methods such as Environmental Product Declaration (EPD), in addition to direct regulations such as various emission standards. Following this trend, life cycle assessment (LCA) techniques that provide quantitative environmental information, such as Human Toxicity Potential (HTP), for buildings are being developed in the construction industry. However, at present, the studies on the environmental database of building materials are not sufficient to provide this support adequately. The purpose of this study is to analysis human toxicity potential of major building material production stage using life cycle assessment. For this purpose, the theoretical consideration of the life cycle assessment and environmental impact category was performed and the direction of the study was set up. That is, the major material in the global warming potential view was drawn against the building and life cycle inventory database was selected. The classification was performed about 17 kinds of substance and impact index, such as human toxicity potential, that it specifies in CML2001. The environmental impact of analysis human toxicity potential for the building material production stage was calculated through the characterization. Meanwhile, the environmental impact of building material in the same category was analyze based on the characterization impact which was calculated in this study. In this study, establishment of environmental impact coefficients of major building material by complying with ISO 14040. Through this, it is believed to effectively support the decisions of stakeholders to improve the environmental performance of buildings and provide a basis for voluntary participation of architects in environment consideration activities.

Keywords : human toxicity potential, major building material, life cycle assessment, production stage

Conference Title : ICGBTES 2018 : International Conference on Green Building Technology and Environmental Sustainability

Conference Location : Rome, Italy

Conference Dates : July 23-24, 2018