The Effect of 4-MCHM on Daphnia magna Population Change

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Purpose: The purpose of this experiment is to investigate the effect of 4-Methylcyclohexanemethanol (a coal cleaning agent) on the population change in Daphnia Magna. Procedure: The Daphnia magna are contained in 4 plastic containers, each filled with 100 ml spring water, and in concentrations for the first trial of 1%, 0.1%, 0.01%, and 0%(control). The concentrations for the 2nd trial are 0.001%, 0.0005%, 0.0001%, and 0%(control). 10 Daphnia magna are used for the first trial, and 12 are used for the second trial. The population size is recorded every third days, for 26 days. They are fed every third day. Conclusion: It can be concluded from the data that the addition of 1,4-Cyclohexanedimethanol decreased the population of Daphnia Magna. 1,4-CHDM, and therefore 4-Methylcyclohexanemethanol, has a dangerous effect on the population of Daphnia Magna over a period of time. This could be caused by effects on reproductive health, egg development, respiratory damage, or other health problems contributing to the mortality of Daphnia Magna. Aquatic ecosystems depend on these freshwater crustaceans. In 2014, 4-MCHM spilled into the freshwater environment of Elk River, West Virginia, from a coal combustion factory. This chemical is often used in factories to clean coal, and was thought to be safe to use. After a spill, 4-MCHM has been tested on rats and guinea pigs, causing decreased activity and mortality. In humans it has caused skin irritation and cold-like symptoms, and damage to DNA biomarkers in human cells. From this investigation it can be observed that 4-MCHM causes serious health problems, and should not be used at all in any industries.