

# Characterization of 1-MCP gas from synthesis of various ratios of lithium diisopropylamide (LDA) and 3-chloro-2-methylpropene (CMP)

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## Abstract

1-methylcyclopropene (1-MCP) is a gaseous chemical agent which has the ability to inhibit the receptor of ethylene producer on horticultural commodities. 1-MCP can extend the shelf life of fresh products effectively. Although various 1-MCP products have been commercialized, their availability in Indonesia is rarely found and also their price is expensive for farmers. Therefore, studies have been carried out to synthesise 1-MCP using lithium diisopropylamide (LDA) and 3-chloro-2-methylpropene (CMP). The aim of this study was to investigate the characteristics of 1-MCP gas (profile of forming and concentration of 1-MCP) that was produced by synthesis of various concentration ratios of LDA and CMP agent. There were nine levels of the concentration ratios of LDA: CMP (5:1, 4:1, 3:1, 2:1, 1:1, 1:2, 1:3, 1:4 and 1:5). The product of LDA and CMP reaction was lithiocyclopropene (LCP) liquid, and when reacted further with water will produce 1-MCP gas. Each treatment was added with destilate water at ratio 1:1 in vial glass. Formed 1-MCP gas was analyzed every 3 in 24 hours using Gas Chromatography (GC). The results showed that all treatments could produce 1-MCP gas instantaneously when added with water (0 hours), and then increased shortly and reached the peak in 9 hours at the ratios (LDA: CMP) of 3:1, 4:1 and 5:1 while the other treatments in 24 hours. The ratio of LDA to CMP at 4:1 was the best composition in releasing 1-MCP where 1-MCP gas was generated rapidly since 0 to 9 hours and reached the highest concentration at about  $4065.9 \times 10^3$  ppm. 1-MCP gas from all treatments was expected having good potential to inhibit the receptors of ethylene producer on fresh horticultural commodities. But, based on consideration of 1-MCP generating behavior, the treatment that showed more effective inhibition against ethylene receptor was the 4:1 ratio.