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INFLUENCE OF DIFFERENT STORAGE CONDITIONS ON THE STABILITY OF CHLORPYRIFOS IN FORMULATION AND TECHNICAL PESTICIDES

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ABSTRACT

The aim of this study was to investigate the stability of chlorpyrifos as active ingredient in chlorpyrifos 97% TC and in formulation of pestban 48% EC under different storage conditions such as storage at different temperature degrees (0, 54 and 72°C), storage in dark & under direct sunlight and storage under UV-light. Chlorpyrifos active ingredient in chlorpyrifos 97% TC and pestban 48% EC was determined by using GLC instrument. The obtained results showed that the chlorpyrifos active ingredient in chlorpyrifos 97% TC and pestban 48% EC was 96.54% and 47.66% respectively at zero time before storage and reached to 94.81% and 45.86% with corresponding percentage loss of 1.79% and 3.78%, respectively after storage at 54°C for 14 days but after storage at 72°C for 3 days the chlorpyrifos active ingredient become 93.76% and 43.46% with corresponding percentage loss of 2.88% and 8.81%, respectively while the chlorpyrifos active ingredient in chlorpyrifos 97% TC reached to 90.35% with percentage loss of 6.41% after storage in dark place for 180 days but after storage under direct sunlight for 180 days the active ingredient reached to 61.48% with percentage loss of 36.32%. Also the results showed that the chlorpyrifos active ingredient in pestban 48% EC reached to 44.97% with percentage loss of 5.62% after storage in dark place for 180 days but after storage under direct sunlight for 180 days the active ingredient reached to 35.75% with percentage loss of 24.99 %. The results showed that the chlorpyrifos active ingredient in pestban 48% EC after storage at 0°C for 7 days reached to 47.54% with percentage loss of 0.25%. The results also showed that the residual levels of chlorpyrifos in chlorpyrifos 97 % TC and in pestban 48 % EC after one hour of exposure to direct UV-light decreased to 482.10 µg and 484.65 µg with percentage loss of 3.58 % and 3.07 %, respectively and reached to 372.34 µg and 379.35 with percentage loss of 25.53% and 24.13%, respectively after 8 hours of exposure and hence the calculated half–life time ($t_{1/2}$) of chlorpyrifos in chlorpyrifos 97% TC and pestban 48% EC was 21.94 and 23.98 hours, respectively after exposure to UV-light for 8 hours. The previously mentioned results clearly showed that there is a positive relationship between temperature degrees or intensity of sunlight & UV-rays, long period of storage and the degradation rate of active ingredient in pesticides under study and hence the best stability could be achieved if the pesticides under study were stored at lower temperature degrees while storage at high temperature such as 72°C was the more effective on the degradation of pesticides than 54°C. Also the best

storage stability could be achieved if the pesticides were stored in dark place than in sunny place and weren't exposed to UV-rays**.**

Key words: active ingredient, degradation rate, GLC, half-life time, UV-rays and storage stability.