# Influence of additives on the hydrothermal dechlorination of PVC

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Polyvinyl chloride (PVC) is a versatile plastic often formulated with various additives, including heat stabilizers, plasticizers, fillers, chlorinated paraffins, and other compounds.[1] While these additives serve essential functions during the service life of PVC, they also significantly influence the hydrothermal dechlorination process, a phenomenon that remains not fully understood.

This study systematically investigates the effects of these additives, employing simplified formulations to isolate their individual contributions. The findings reveal that some additives accelerate dechlorination, while others hinder it by introducing mass transfer resistance. The interplay between these additives and their interaction with particle size are also explored. The investigation focuses on changes in kinetic behavior, described using either first-order reaction models or the shrinking core model. The results highlight the challenges in improving hydroxyl nucleophilic substitution beyond 30% under non-catalytic hydrothermal conditions[2], providing insights into the limitations of current approaches.

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