

**Title** Effect of temperature and relative humidity on yellowing rate of paddy  
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#### **Abstract**

The effects of temperature and relative humidity (or water activity) in storage chambers on yellowing rate of paddy were investigated and then an empirical equation for predicting the yellowing rate was developed. Paddy was conditioned using saturated salt solutions at relative humidities ranging from 0.80 to 0.95 and temperatures of 35, 45, 55, 60 and 65°C. The yellowing rate was found to follow the zero order kinetics. The yellowing constant value ( $k$ ) increased exponentially with temperature and increased linearly with water activity. The magnitude of apparent activation energy varied from 130–145 kJ/mol. A predictive equation for determining yellowing rate was  $\ln k = \alpha - \delta a_w - \varepsilon/T + (\gamma a_w)/T$  where  $a_w$  was water activity (valid from 0.80 to 0.95),  $T$  was absolute temperature (valid from 308 to 338 K) and  $\alpha$ ,  $\delta$ ,  $\varepsilon$  and  $\gamma$  were constants. The results of variance analysis showed that temperature, water activity and their interaction significantly influenced the yellowing rate of paddy.