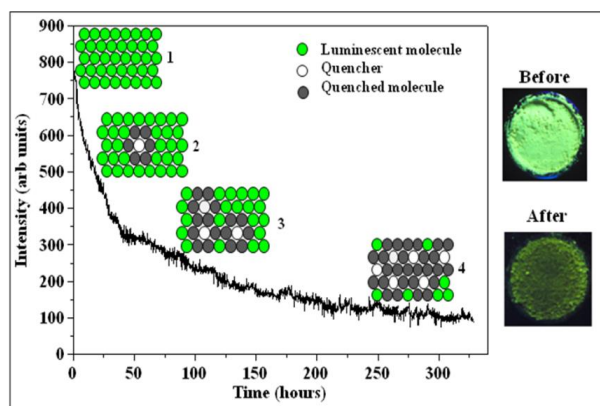




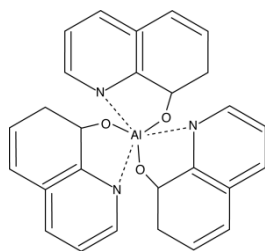
## Investigation of the luminescent properties of metal quinolates ( $Mq_x$ ) for use in OLED devices.

**Mart-Mari Duvenhage**

Since Tang and VanSlyke developed the first organic light emitting diode (OLED) in the late 80's using tris-(8-hydroxyquinoline) aluminium ( $Alq_3$ ) as both the emissive and electron transporting layer, a lot of research has been done on  $Alq_3$  and other metal quinolates ( $Mq_x$ ). The optical, morphological and electrical properties of these  $Mq_x$  have been studied extensively.  $Alq_3$  has, however, a disadvantage as it tends to degrade when stored under atmospheric conditions. These degraded products are non-luminescent and lead to poor device performance (figure 1). A good understanding of what happens during the degradation process and ways of eliminating this process are needed. In this study different  $Mq_x$  compounds were synthesized and their degradation behavior was studied to see what effect it has on their luminescent properties. The ultimate goal of the study was to fabricate OLED devices that can be used in display devices and as solid state lighting devices (figure 2).



**Figure 1: Degradation of  $Alq_3$  under UV exposure ( $\lambda = 365$  nm).**



**Figure 1: Metal quinolates can be used to fabricate display devices and solid state lighting panels.**