

Quantification of luminescence inhibition on TLC plates

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Objectives

- Development of an algorithm for evaluation of luminescence inhibition on TLC plates
- Comparison of TLC plate test with classic cuvette test
- Application in water analysis

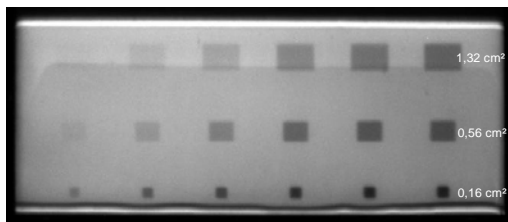
Conclusions

- Sensitivity of luminescence inhibition test on TLC plate was found to be very high compared to cuvette test
- New luminescence inhibition was detected in treated process waste waters using TLC test

Method comparison

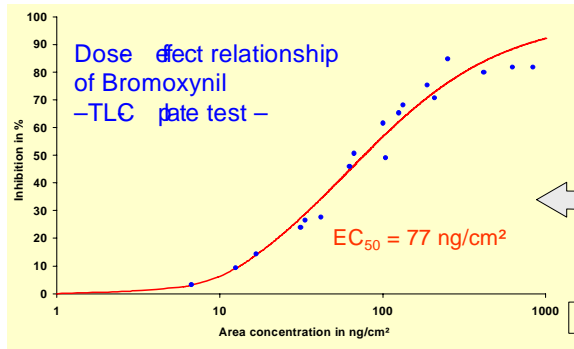
Luminescent inhibition test on TLC plates

- Application of substance onto silica gel plates
- Submerging into bacteria suspension
- Taking a picture After the Incubation time of 10 min
- Determination of the Inhibition values by a special software.



$$I^S = 1 - \frac{\sum_{n_1}^{n_2} i_n^S}{\sum_{n_1}^{n_2} i_n^S}$$

I = Inhibition
S = Sample
i = Intensity
n = Pixel number

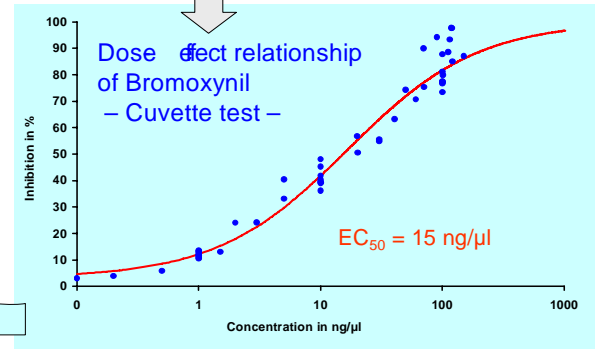


Luminescent inhibition cuvette test

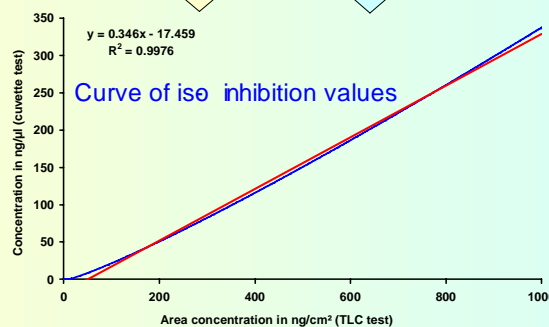
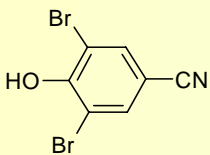
- Sample + 2 % NaCl
- Addition of bacteria suspension
- Incubation time of 30 min at 15 °C (LUMIStherm)
- Detection (LUMIStox 300)



(1) LUMIStox 300
(2) LUMIStherm



Sensitivity of TLC test is increased by a factor (F) of 1440 for pesticide Bromoxynil



$$F = m \cdot \frac{V}{A}$$

m = Slope
V = Sample volume (cuvette test)
A = TLC application area

For example:
V = 500 µl; A = 0.12 cm²

Application example: Investigation of UV oxidation by-products

