Application note
Triathler technical features

Triathler luminescence dynamic range

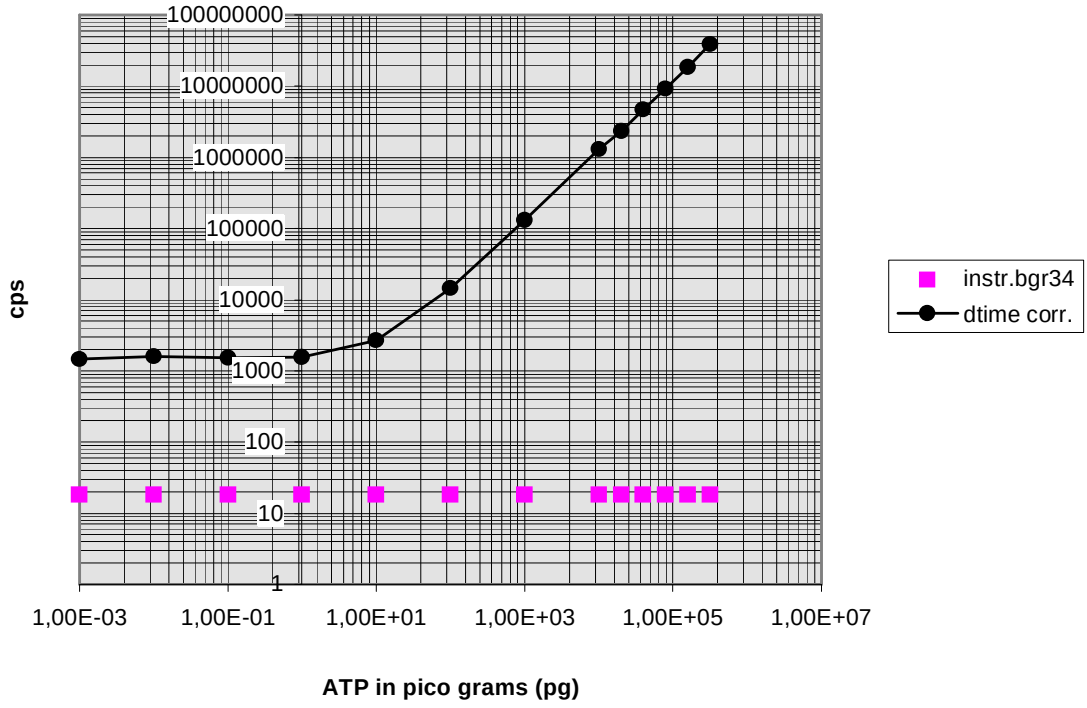
Key words: Luminescence, LLD, Eppendorf tube

Triathler's luminescence dynamic range was studied with 1243-118 ATP Biomass Kit from Bio-Orbit. A set of ATP dilution standards was prepared from the ATP stock standard delivered with the kit. The standards were measured in Eppendorf® tubes according to the kit instructions. In short, each tube contained:

0.1 ml of Tris-Acetate buffer as a "sample", 0.5 ml of ATP Monitoring Reagent solution (diluted according to the kit instructions), 0.01ml of ATP standard. ATP Releasing agent, included in the kit for releasing ATP from wells, was omitted: The results are shown in the graph below: The instrument background (empty chamber) was <100 cps (here as low as 18 cps). The reagent background (no ATP) was about 1800 cps (perhaps indicating some contamination introduced in the procedure).

As can be seen Triathler can count up to 50 million cps. The lowest limit of detection (LLD) in this particular measurement was about 1-10 pico g ATP, limited mainly by the reagent background. The instrument background would allow about 100 times smaller LLD.

Luminescence range and lower limit of detection (LLD)



Sensitivity and EC50 value

Methods

The sensitivity was determined by measuring M1): light output from an ATP standard (the official method in Bio-Orbit quality control), and M2): light output from the photobacterium Vibrio fischeri. The readings were compared with the instrument background (iBKG).

- Sensitivity = iBKG + 3 * std. Deviation

The EC50 value was determined with ZnSO4 * 7H2O with the contact time of 30 minutes, according to the standard method. Between measurements the samples were incubated in the temperature of 15°C.

All measurements were done with the Triathler and Bio Orbit 1257 (Sirius) luminometer.

Results

Sensitivity (M1)	Sirius	Triathler
mol/ml ATP	1.67E-15	5.26E-16
pg/ml as free ATP	0.85	0.27

Sensitivity (M2)	Sirius	Triathler
% *V. fischeri*	0.025	0.001

EC50	Sirius	Triathler
mg/l $ZnSO_4 * 7H_2O$	28.0	27.7