Electronic Supplementary Information for Manuscript B710406E

1. Justification of Cytotoxicity and Genotoxicity Thresholds

The cytotoxicity controls indicate that the yeast is reacting normally to gross toxicity in its environment. The `high' methanol standard should reduce the cell density to below the 80% threshold and should be a lower value than the `low' standard.

The genotoxicity controls demonstrate that the strains are responding normally to DNA damage. The `high' MMS (methyl methane sulphonate) standard should produce a fluorescence induction greater than the genotoxicity threshold of 1.3 and be a greater value than the 'low' MMS standard, indicating a dose-dependent effect on the reporter.

Both thresholds are greater than three times the variation onserved in negative controls and therefore represent a significant toxic insult on the biosensor.

In addition to the negative controls, the growth inhibition and genotoxicity controls are in place for qualitative reasons to demonstrate that the assay is responding correctly and in a dose-dependent manner. As these are qualitative the exact figures for relative total growth and fluorescence induction of the controls are not used in any calculations of toxicity/genotoxicity of the particular compounds being analysed. The controls are included on each microplate tested. With respect to the controls on the 29 microplates tested in this study, all controls passed the aforementioned criteria. The average relative cell densities of the high and low methanol controls were 44.1 and 82.1, respectively. The average relative GFP inductions of the high and low MMS controls were 2.31 and 1.40, respectively.

2. Cyotoxicity and Genotoxicity LOEC Values

TABLE SI1 Cytotoxicity LOEC values for effluents treated by two colour removal methods at increasing periods.

Effluent	Treatment Description	LOEC concentrations (%) for treatment periods A-F (times vary, duration increases A-F)					
		A	B	C	D	E	F
#1	Ozone	-	-	-	-	-	-
	Electrochemical Oxidation;						
	A) 2.5 % NaCl, 1000 A m^{-2}, RuO_2 anode	-	100	50	N/A	N/A	N/A
	B) 2.5 % NaCl, 500 A m^{-2}, RuO_2 anode	-	100	100	50	50	N/A
#2	Ozone	100	25	12.5	12.5	25	100
	Electrochemical Oxidation;						
	A) 2.5 % NaCl, 1000 A m^{-2}, RuO_2 anode	50	25	50	100	12.5	N/A
	B) 2.5 % NaCl, 500 A m^{-2}, RuO_2 anode	50	25	25	50	50	N/A
	C) 0 % NaCl, 1000 A m^{-2}, Diamond anode	100	100	100	50	N/A	N/A
	D) 0 % NaCl, 1000 A m^{-2}, RuO_2 anode	100	50	25	N/A	N/A	N/A
#3	Ozone	100	-	-	-	-	-
	Electrochemical Oxidation;						
	A) 2.5 % NaCl, 1000 A m^{-2}, RuO_2 anode	-	100	25	25	N/A	N/A
	E) 1 % NaCl, 1000 A m^{-2}, RuO_2 anode	-	100	50	N/A	N/A	N/A

TABLE SI2 Cytotoxicity LOEC values for effluents treated by two colour removal methods at increasing periods.

Effluent	Treatment Description	LOEC concentrations (%) for treatment periods A-F (times vary, duration increases A-F)					
		A	B	C	D	E	F
#1	Ozone	-	-	-	100	-	-
	Electrochemical Oxidation;						
	A) 2.5 % NaCl, 1000 A m^{-2}, RuO_2 anode	-	-	50	N/A	N/A	N/A
	B) 2.5 % NaCl, 500 A m^{-2}, RuO_2 anode	-	-	-	25	12.5	N/A
#2	Ozone	-	-	-	-	-	-
	Electrochemical Oxidation;						
	A) 2.5 % NaCl, 1000 A m^{-2}, RuO_2 anode	-	-	-	-	-	N/A
	B) 2.5 % NaCl, 500 A m^{-2}, RuO_2 anode	-	-	-	-	-	N/A
	C) 0 % NaCl, 1000 A m^{-2}, Diamond anode	-	-	-	-	N/A	N/A
	D) 0 % NaCl, 1000 A m^{-2}, RuO_2 anode	-	-	-	N/A	N/A	N/A
#3	Ozone	12.5	50	50	25	50	100
	Electrochemical Oxidation;						
	A) 2.5 % NaCl, 1000 A m^{-2}, RuO_2 anode	25	-	-	-	N/A	N/A
	E) 1 % NaCl, 1000 A m^{-2}, RuO_2 anode	25	-	-	N/A	N/A	N/A

3a. Ozonation Set-Up

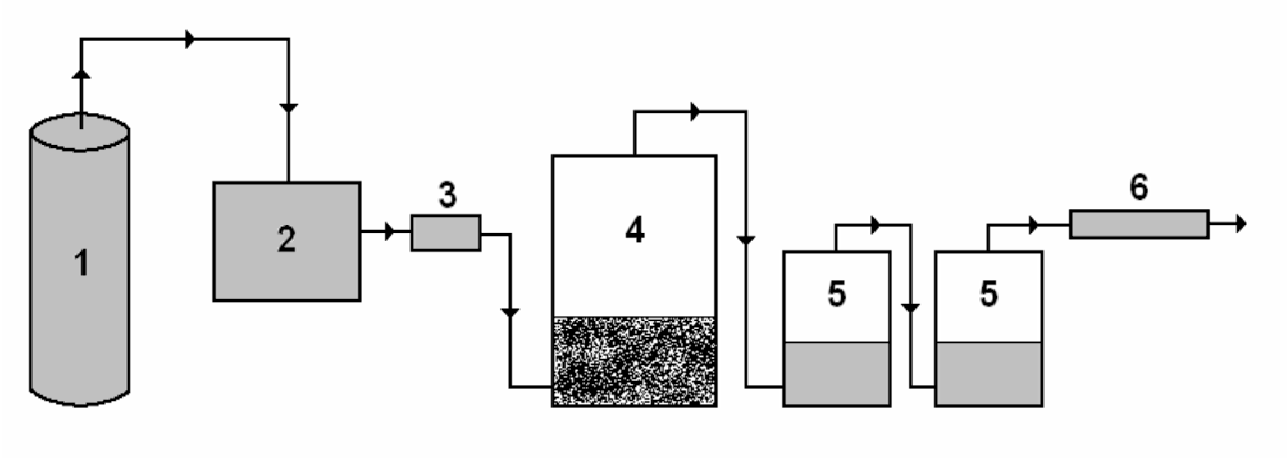

Fig SI1a Apparatus for the decolourisation of dye effluents by ozone treatment (adapted from Hassan, 1999).

3b. Electrochemical Oxidation Set-Up

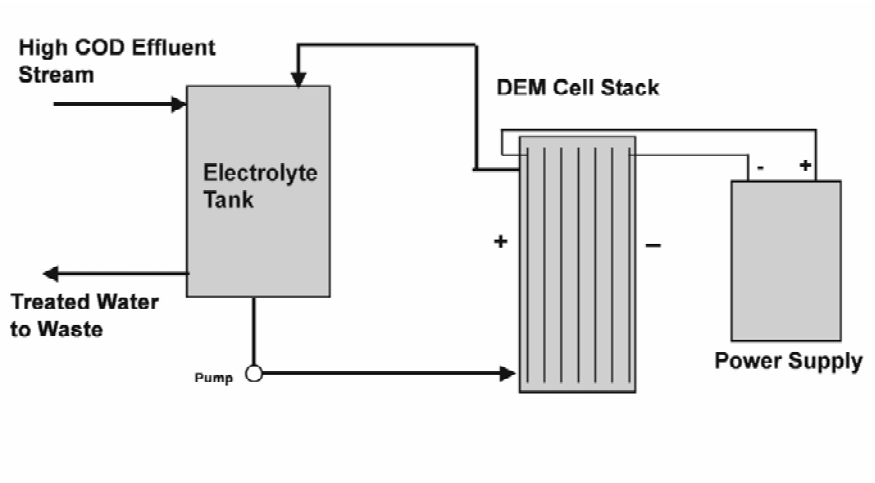

Fig SI1b Apparatus for the decolourisation of dye effluents by electrochemical oxidation.

4. Ozone Calibration Curve

(a)

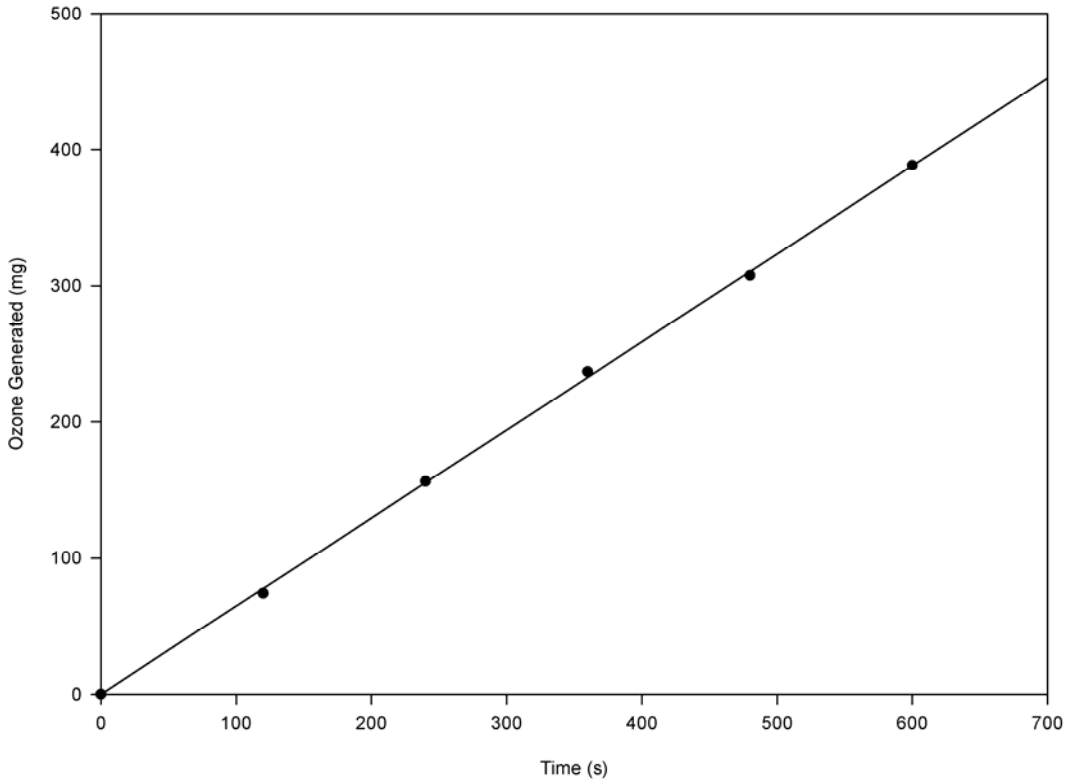

Fig. 4a Ozone generation calibration using a flow rate of 0.5 L min^{-1}

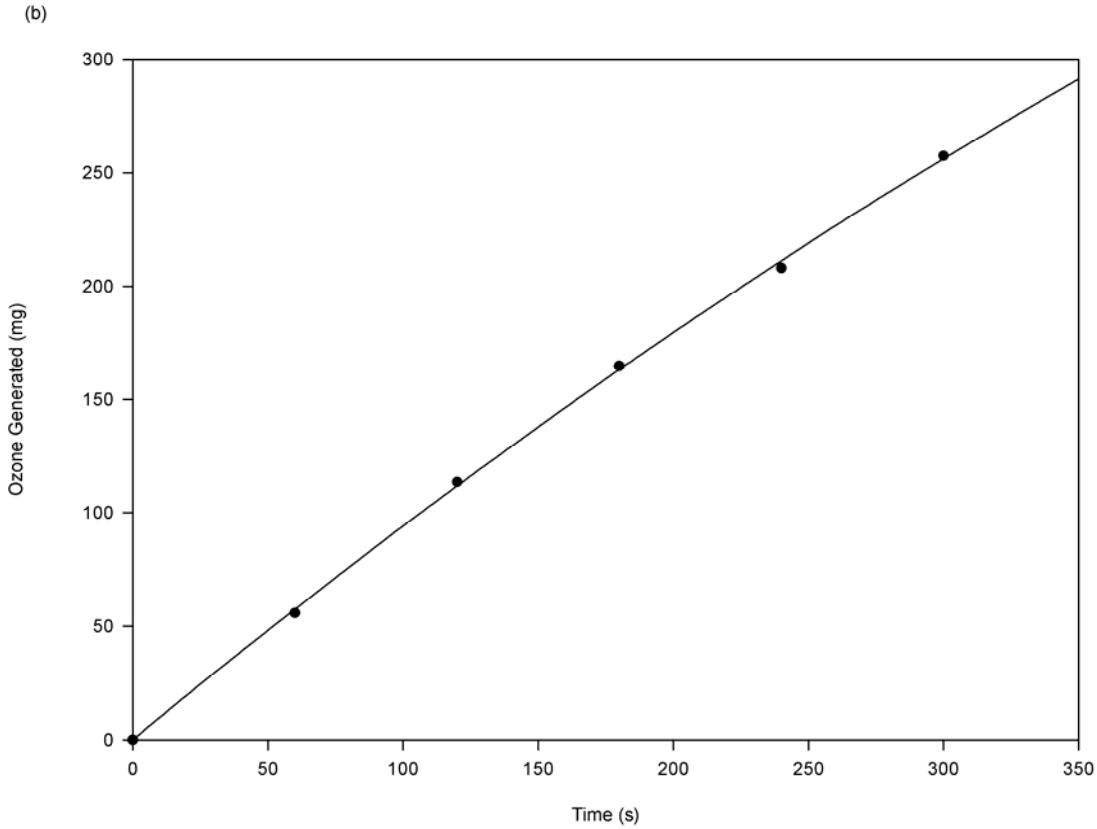

Fig. 4b Ozone generation calibration using a flow rate of 1 L min^{-1}