Electronic Supplementary Material (ESI) for RSC Advances

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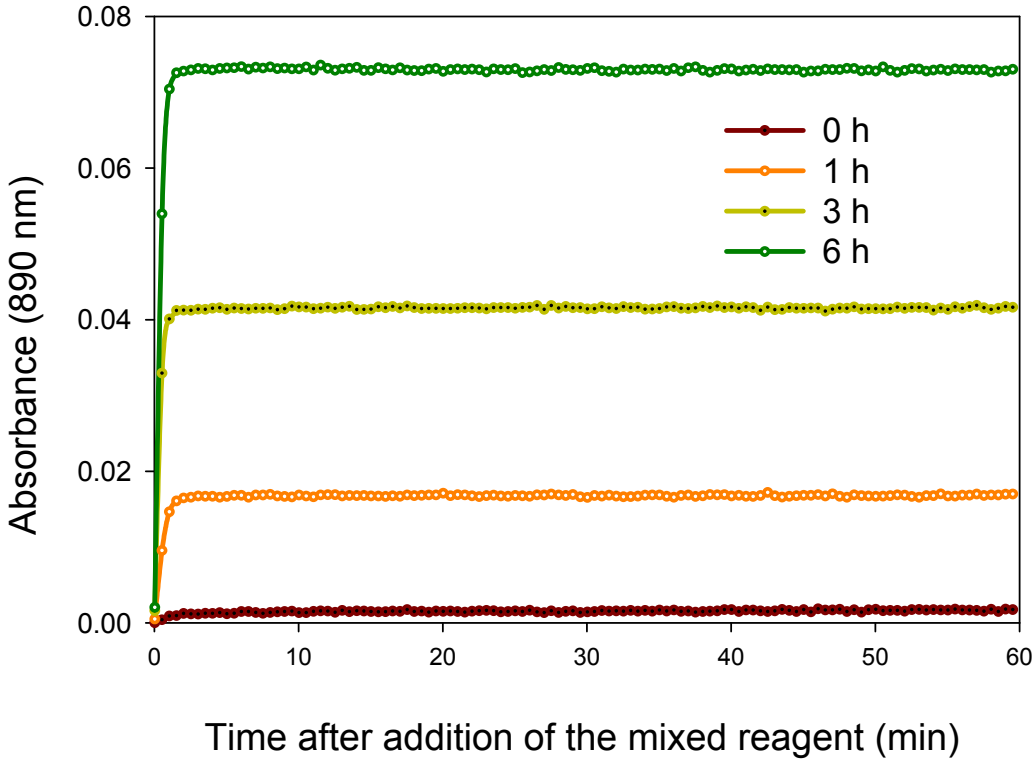
Hydrolysis of Glucose-6-phosphate in Aged, Acid- Forced Hydrolysed Nanomolar Inorganic Iron Solution — An Inorganic Biocatalyst?

ESI-Figure 1: Time courses of formation of phosphorantimonylmolybdenum blue complex from phosphate released from hydrolysis of 20 μM G6P in an aged (4-month) 1000 nM inorganic iron solution at room temperature (22 ± 2°C) at G6P hydrolysis times of 0, 1, 3, and 6 hours, respectively. The absorbance was recorded every 30 seconds at 890 nm with background corrections at 780 and 1020 nm after the mixed reagent (molybdate plus ascorbic acid) was added to sample solutions. The color development reached equilibrium within 5 minutes and remained stable for hours. Because there was G6P in the samples, the stable absorbance of phosphorantimonylmolybdenum blue complex indicates that addition of the mixed reagent effectively stopped further hydrolysis of remaining G6P in the samples.



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ESI-Table1: Effect of Tris-buffer solution on the G6P hydrolysis in a 1000 nM aged (14-month) inorganic iron solution[a].

Treatment[a]	Initial OP (μM)	Reaction time (h)	IP (μM)	Rate constant (10^{-6} sec^{-1})	Half-life (h)
Tris-HCl buffer (5 mM, pH7.0)	20	0	0.22	1.72	111.8
		1	0.35		
		2	0.41		
		6	0.93		
DIW	20	0	0.22	22.1	8.7
		1	1.75		
		2	3.37		
		6	7.74		
Tris-HCl buffer (5 mM, pH7.0)	50	0	0.44	1.93	99.8
		1	0.71		
		2	0.99		
		6	2.45		
DIW	50	0	0.44	11.3	17.1
		1	2.45		
		2	4.58		
		6	11.14		

[a] Buffer experiments were conducted with a 1000 nM aged (14-month) inorganic iron solution. The iron solution diluted by DIW (1:1) was used as a control. Either 4 ml of 10 mM Tris-HCl (pH7.0) or 4 ml of DIW was mixed with a 4 ml of aged iron solution, then 0.1 ml of 1.6 or 4.0 mM G6P stock solution was added to make a final solution containing 20 or 50 μM G6P. IP concentration was determinated at 0, 0.17, 1, 2 and 6 hour, respectively, after the addition of G6P. The results of IP in the table was an average of three replications. The rate constant and half-life were calculated based on the first order kinetics.