Figure S1: Experimental X-band EPR spectra of Mixtures Glucur/Cr^{VI} at (a) 10 min, (b) 1.0 h , [Glucur] = 1.0 M, pH = 1.0; [Cr^{VI}] = 0.48 mM; Mod. Amp = 2.0 G, Sweep Width = 1000.0 G; T = 20.0ºC, I = 1.0 M, F ≈ 9.7 MHz

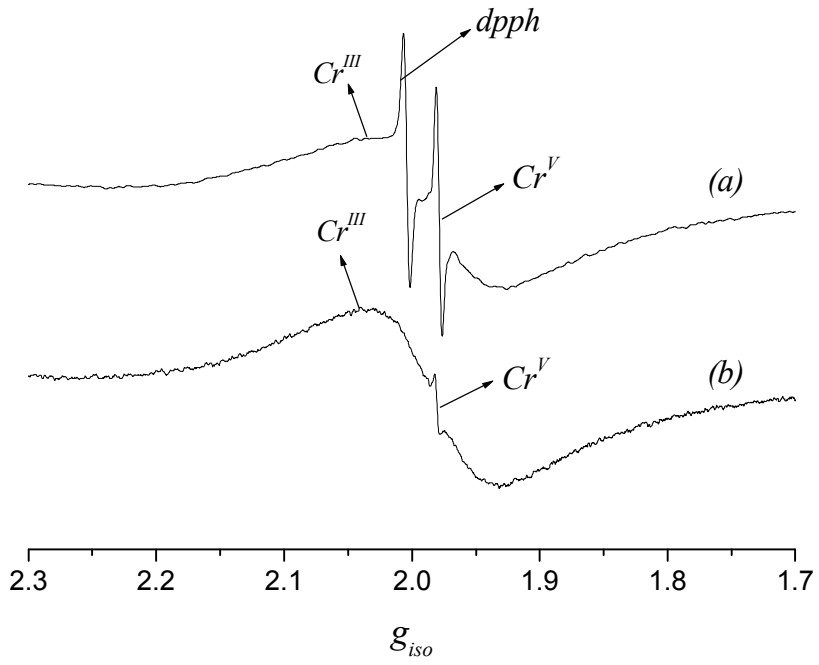


Figure S2: Difference spectra from the reaction of 0.13 M Glucur with 6.5×10^{-4} mM Cr^{VI} and 0.150 mM Fe^{2+} at $[HClO_4] = 0.1$ M. I =1.0 M, $[O_2] = 1.26$ mM and T = 25ºC. The Fe^{2+} was added after reaction Glucur/Cr^{VI} was complete as a reagent for CrO_2^{2+} (a) spectrum before the addition of Fe^{2+} (b) spectra after the addition of Fe^{2+}. Inset: the spectral changes shown represent the absorbance differences (ΔAbs) before and immediately after the addition of Fe^{2+}.

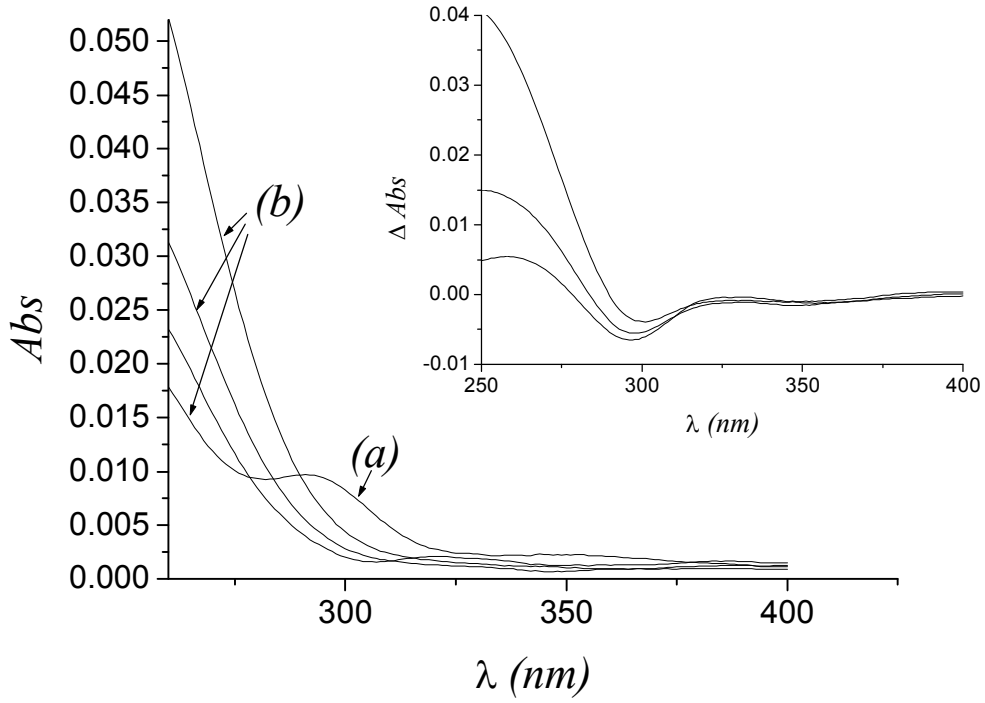


Figure S3: disproportionation of Cr^{IV} in absence of Glucur, T = 15ºC, I = 1.0 and $[H^+]$ = 0.20 , $[Cr^{IV}]$ = 0.07 mM

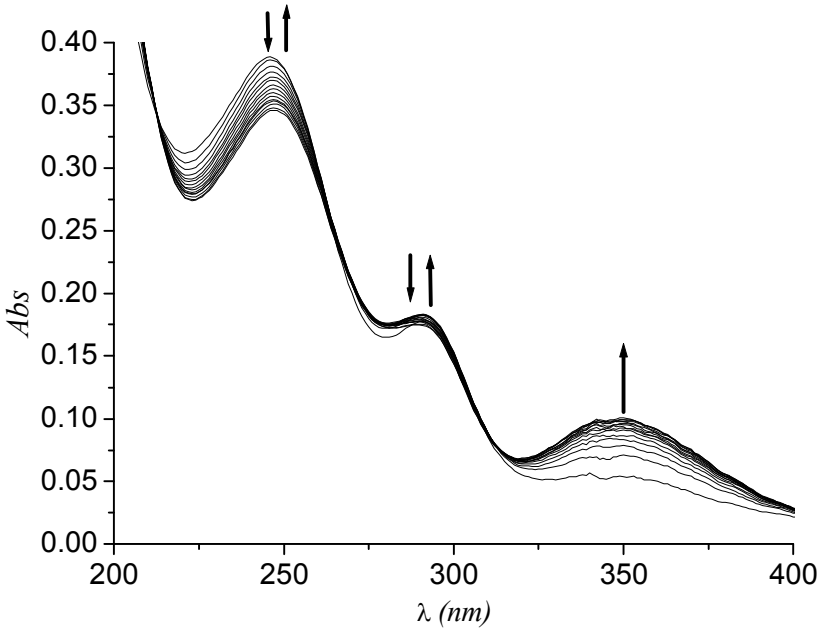


Figure S4
uv-vis spectra of Glucur/Cr^{VI} mixture showing Cr^{III} species.
[Glucur] = 0.80M, [$HClO_4$] = 0.4 M, [Cr^{VI}] = 6.0 mM, I = 1.0, T = 33ºC: (a) 15 min , (b) 40 min, (c) 75 min and (d) 24 h.

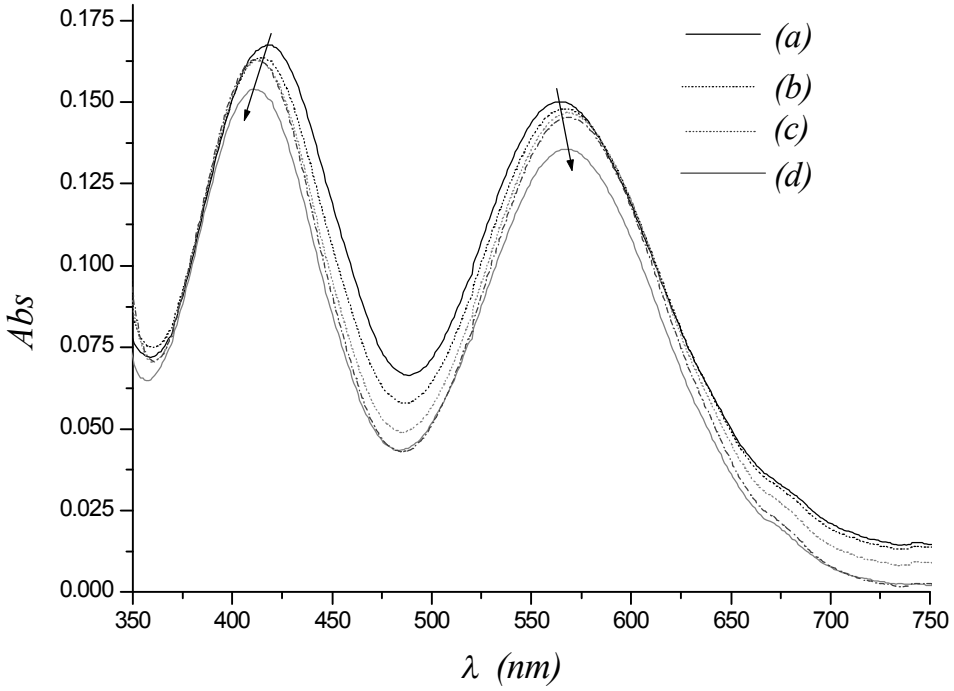


Figure S5: Time evolution of the UV-vis spectra from Glucur/Cr^{VI} mixtures .[Glucur] = 0,72 M; [Cr^{VI}] = 6,0 mM; [$HClO_4$] = 0,20 M; T = 33ºC; I = 1,0 M. Spectra recorded every 2 min; first spectrum taken 10 min after the reaction started.

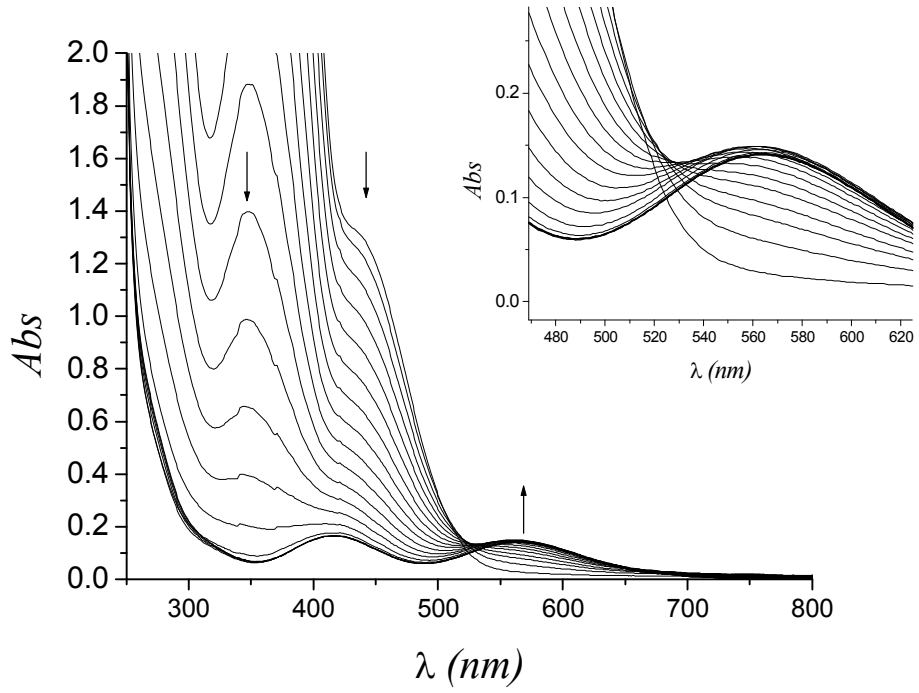
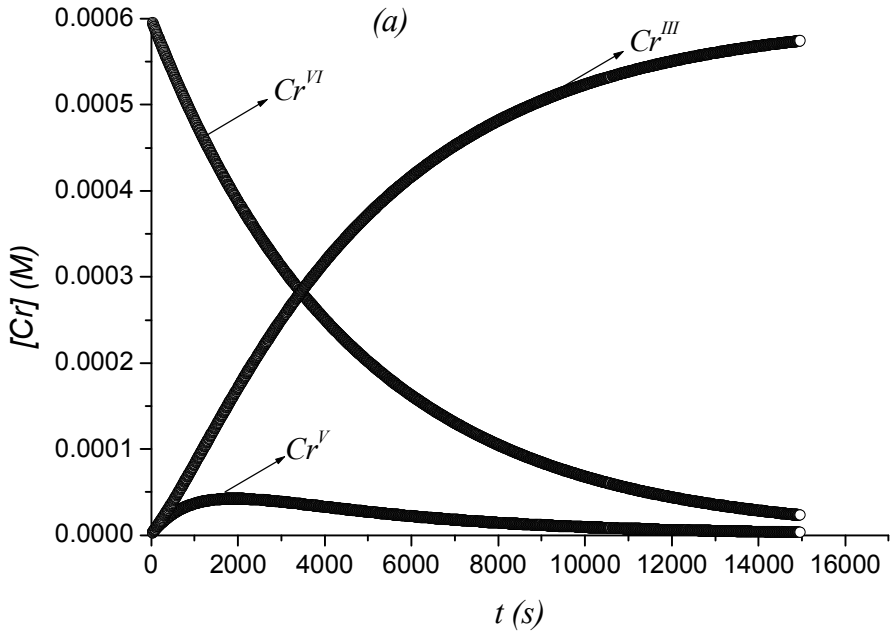


Figure S6: simulated kinetics profiles for Cr species. (a) [Glucur] = 0.18 M, $[H^+]$ = 0.2 M [Cr] calculated using $k_6 = 0.109 \times 10^{-3}\ s^{-1}$, $k_5 = 0.102 \times 10^{-2}\ s^{-1}$ (b) [Glucur] = 0.42 M, $[H^+]$ = 0.96 M [Cr] calculated using $k_6 = 0.407 \times 10^{-2}\ s^{-1}$, $k_5 = 0.500 \times 10^{-2}\ s^{-1}$. T = 33ºC; I = 1.0 M; $[Cr]_T$ = 0.6 mM. k_6 and k_5 calculated using Eqs. 7-12.



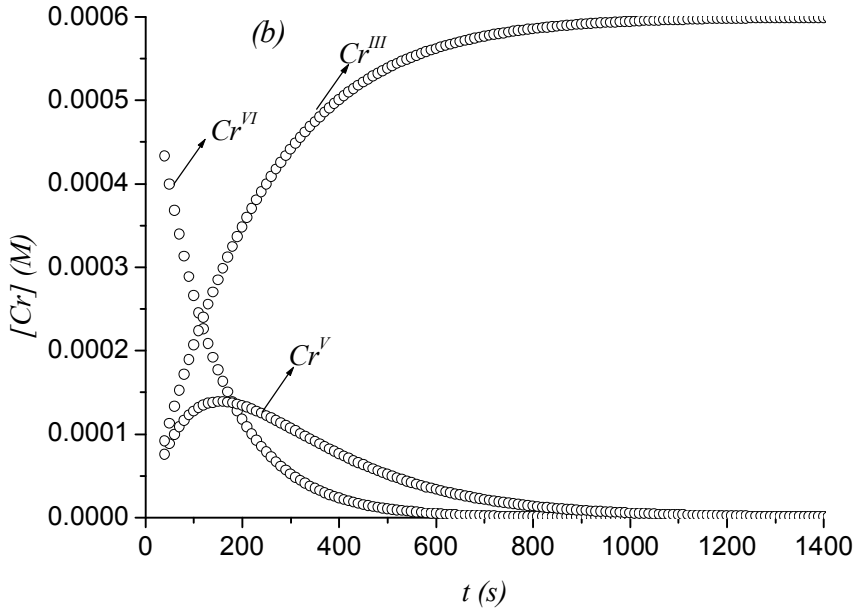


Table S1. lactone concentration in Glucur solutions

[Glucur] (mM)	$HClO_4$ (M)	time[a] (h)	lactone (mM)
180	0.2	0.60	4.3
180	1.0	0.20	7.2
420	0.2	0.28	1.9
420	1.0	0.1	3.8

[a] time necessary to reduce the initial concentration of Cr^{VI} up to 80%.
I = 1,0 M; T = 33ºC.