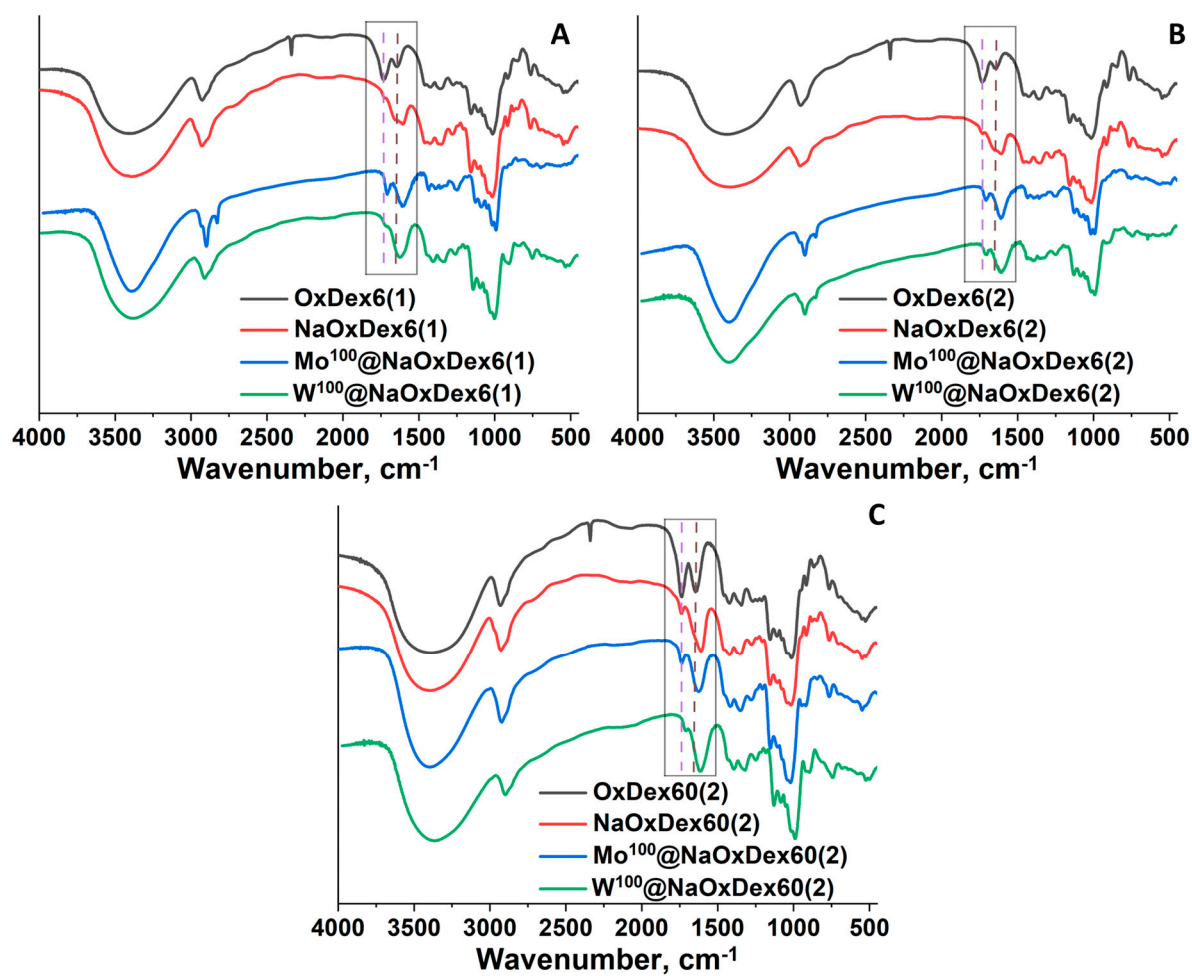# Multifunctional oxidized dextran as matrix for stabilization of octahedral molybdenum and tungsten iodide clusters in aqueous media

Ekaterina V. Pronina [1], Yuri A. Vorotnikov [1,*], Tatiana N. Pozmogova [1], Alphiya R. Tsygankova [1], Kaplan Kirakci [2], Kamil Lang [2], Michael A. Shestopalov [1]

Table S1. Chemical groups content and molecular weights of initial and oxidized dextrans [1].

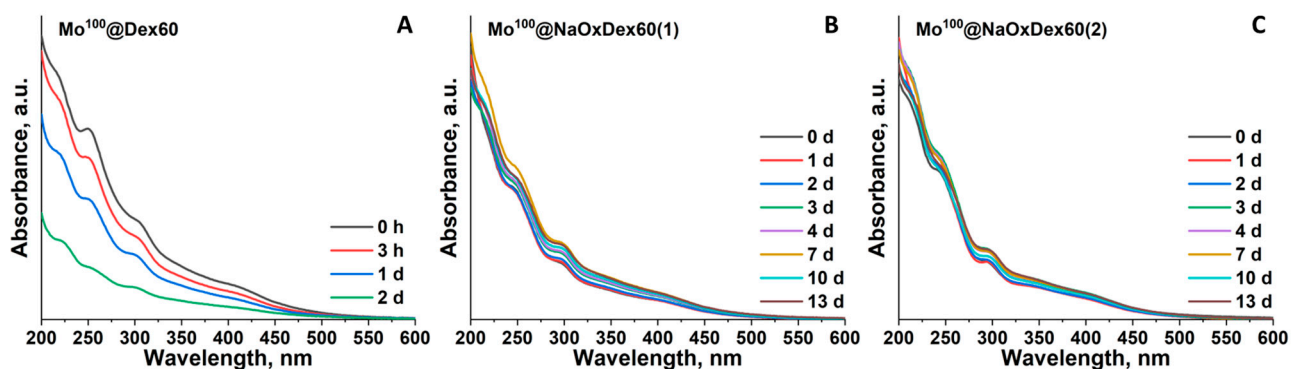| Sample	Carbonyl groups, mmol·g^{-1}	Acidic groups, mmol·g^{-1}	M_w, kDa
Dex6	-	-	6.2
NaOxDex6(1)	0.6	1.4	3.8
NaOxDex6(2)	0.6	2.3	3.9
Dex60	-	-	60.2
NaOxDex60(1)	1.0	1.0	14.0
NaOxDex60(2)	1.3	1.5	4.5
NaOxDex60(2)-red	0.8	1.5	4.5

1. Pronina, E.V.; Vorotnikov, Y.A.; Pozmogova, T.N.; Solovieva, A.O.; Miroshnichenko, S.M.; Plyusnin, P.E.; Pishchur, D.P.; Eltsov, I.V.; Edeleva, M.V.; Shestopalov, M.A.; et al. No Catalyst Added Hydrogen Peroxide Oxidation of Dextran: An Environmentally Friendly Route to Multifunctional Polymers. *ACS Sustain. Chem. Eng.* **2020**, *8*, 5371-5379, doi:10.1021/acssuschemeng.0c01030.
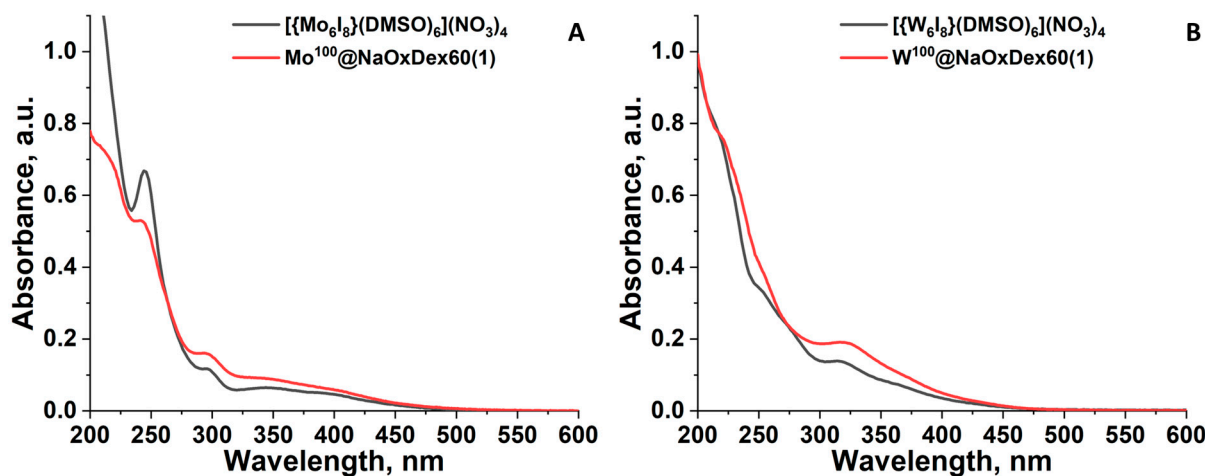
Figure S1. FTIR spectra of OxDexQ(n), NaOxDexQ(n), Mo[100]@NaOxDexQ(n), and W[100]@NaOxDexQ(n) (A – Q = 6, n = 1; B – Q = 6, n = 2; C – Q = 60, n = 2).

Table S2. $\{M_6I_8\}$ content in materials ($\mu mol \cdot g^{-1}$) according to ICP-AES

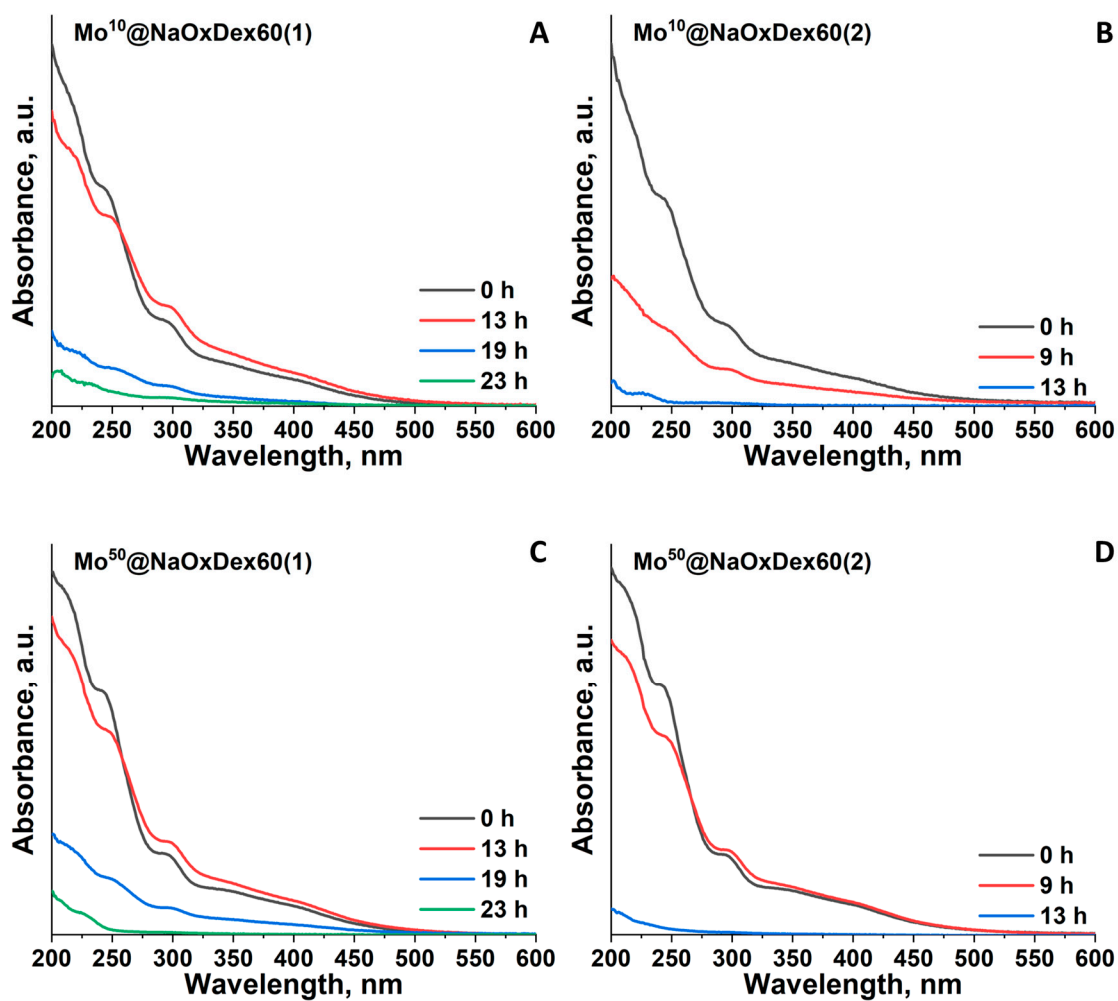| x	10	50	100
M = Mo			
Dex6	-	-	28
NaOxDe6(1)	33	122	139
NaOxDe6(2)	31	127	144
Dex60	-	-	54
NaOxDe60(1)	31	97	115
NaOxDe60(2)	30	118	130
M = W			
Dex6	-	-	48
NaOxDe6(1)	11	51	82
NaOxDe6(2)	13	51	87
Dex60	-	-	59
NaOxDe60(1)	20	49	125
NaOxDe60(2)	16	58	119

Figure S2. UV-vis spectra of Mo^{100}@Dex60 (A), Mo^{100}@NaOxDex60(1) (B), and Mo^{100}@NaOxDex60(2) in water over time.
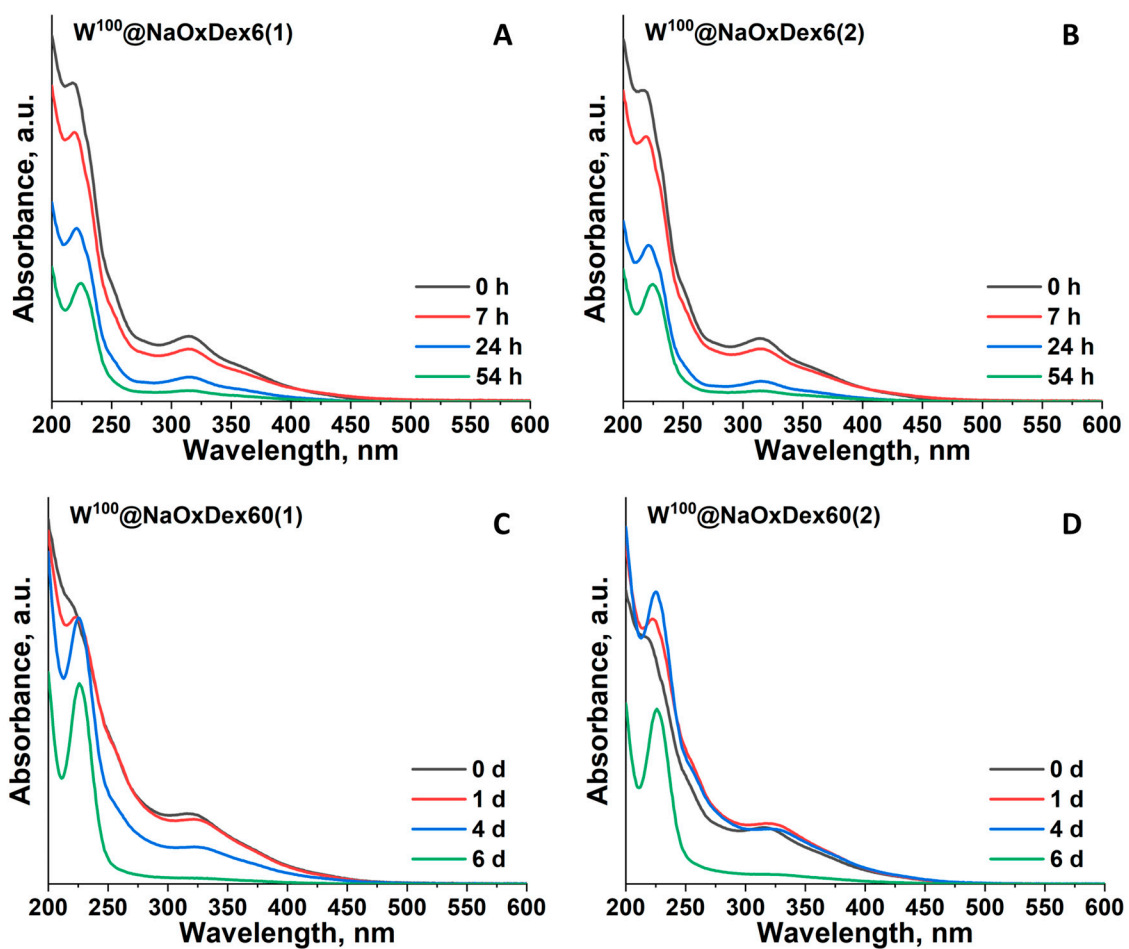

Figure S3. UV-vis spectra of M^{100}@NaOxDex60(1), M = Mo (A) and W (B) in water, in comparison with corresponding initial clusters.
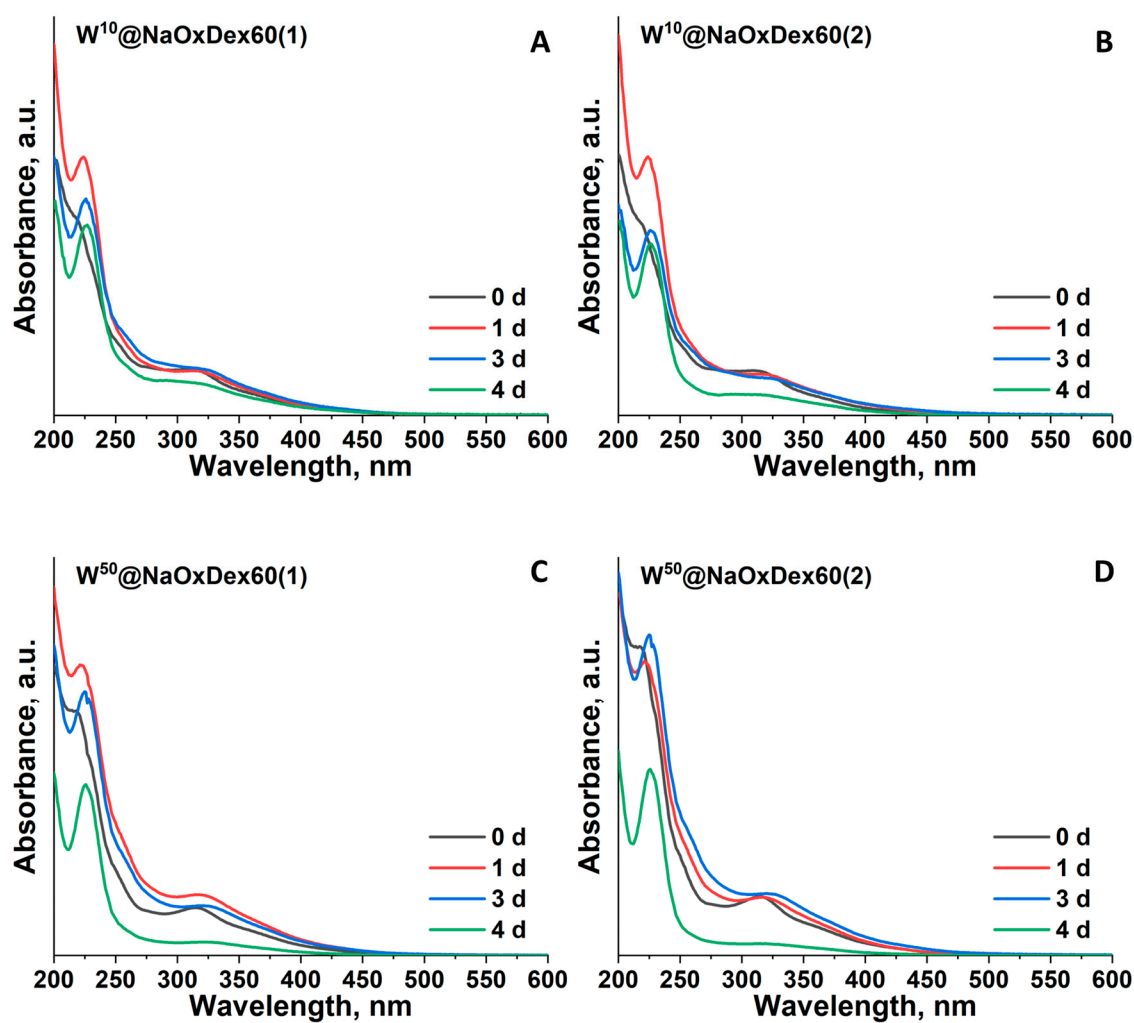
Table S3. Formulation of culture medium DMEM.

Component	Concentration, mg/L	Component	Concentration, mg/L
Inorganic salts		**Amino acids**	
Calcium Chloride · 2H$_2$O	264.92	L-Arginine · HCl	84.00
Ferric Nitrate · 9H$_2$O	0.10	L-Cystine · 2HCl	62.58
Magnesium Sulfate (Anhydr.)	97.67	L-Glutamine	584.00
Potassium Chloride	400.00	Glycine	30.00
Sodium Chloride	6400.00	L-Histidine · HCl · H$_2$O	42.00
Sodium Phosphate, Monobasic (Anhydr.)	108.69	L-Isoleucine	104.80
Vitamins		L-Leucine	104.80
Choline Chloride	4.00	L-Lysine · HCl	146.20
Folic Acid	4.00	L-Methionine	30.00
myo-Inositol	7.00	L-Phenylalanine	66.00
Nicotinamide	4.00	L-Serine	42.00
D-Pantothenic Acid, Hemicalcium Salt	4.00	L-Threonine	95.20
Pyridoxal · HCl	4.00	L-Tryptophan	16.00
Riboflavin	0.40	L-Tyrosine · Na$_2$ · 2H$_2$O	103.79
Thiamine · HCl	4.00	L-Valine	93.60
Other components			
D-Glucose	1000.00	Sodium Bicarbonate	3700.00

Figure S4. UV-vis spectra of $Mo^x@NaOxDex60(n)$ (A – x = 10, n = 1; B – x = 10, n = 2; C – x = 50, n = 1; D – x = 50, n = 2) in DMEM culture medium over time.

Figure S5. UV-vis spectra of W^{100}@NaOxDexQ(n) (A – Q = 6, n = 1; B – Q = 6, n = 2; C – Q = 60, n = 1; D – Q = 60, n = 2) in DMEM culture medium over time.

Figure S6. UV-vis spectra of W^x@NaOxDex60(n) (A – x = 10, n = 1; B – x = 10, n = 2; C – x = 50, n = 1; D – x = 50, n = 2) in DMEM culture medium over time.
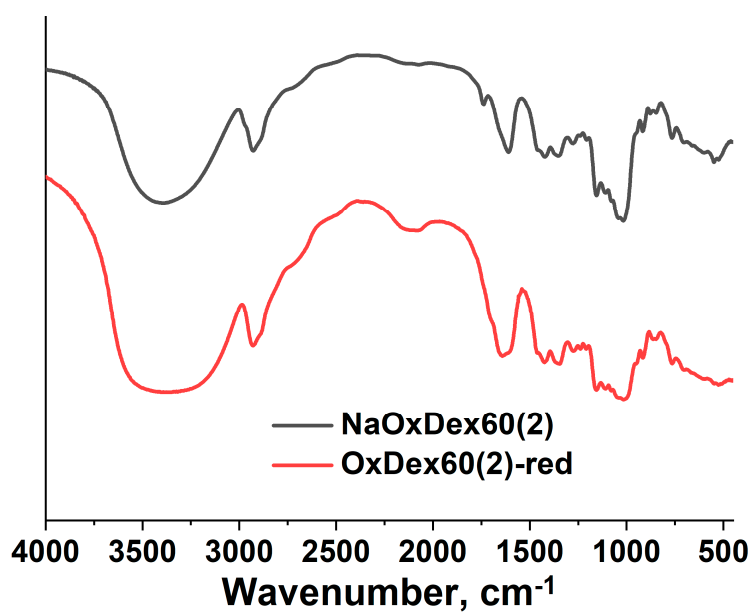
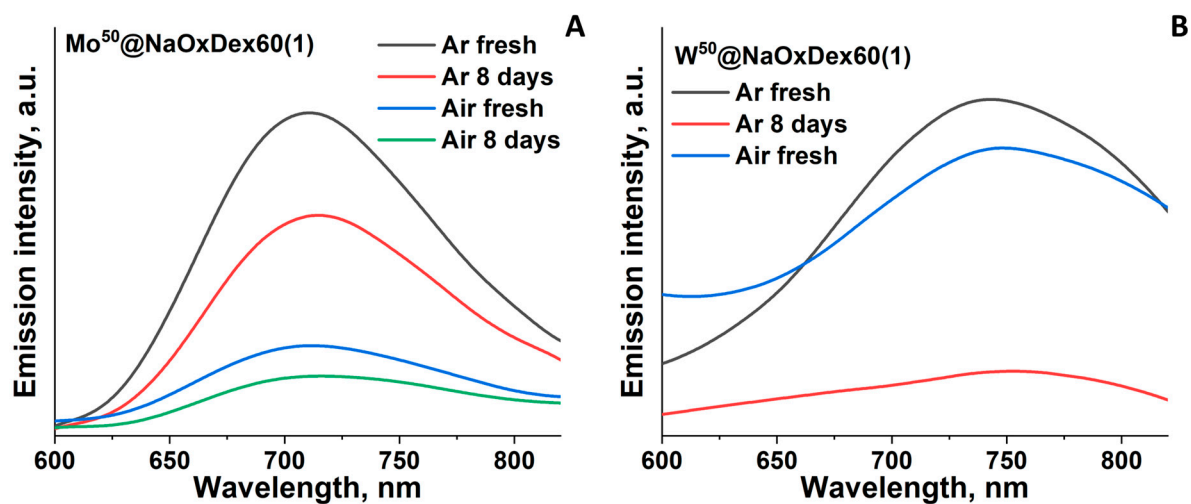**Figure S7.** FTIR spectra of NaOxDex60(2) and NaOxDex60(2)-red.

Figure S8. Emission spectra of fresh and 8-days old solution of Mo^{50}@NaOxDex60(1) in PBS (air and Ar) (A); Emission spectra of fresh and 8-days old solution of W^{50}@NaOxDex60(1) in PBS (air and Ar) (B).