Electronic Supplementary Material (ESI) for New Journal of Chemistry.


**Supplementary Information to**

# Polyoxovanadates inhibition of *Escherichia coli* growth shows a reverse correlation with $Ca^{2+}$-ATPase inhibition

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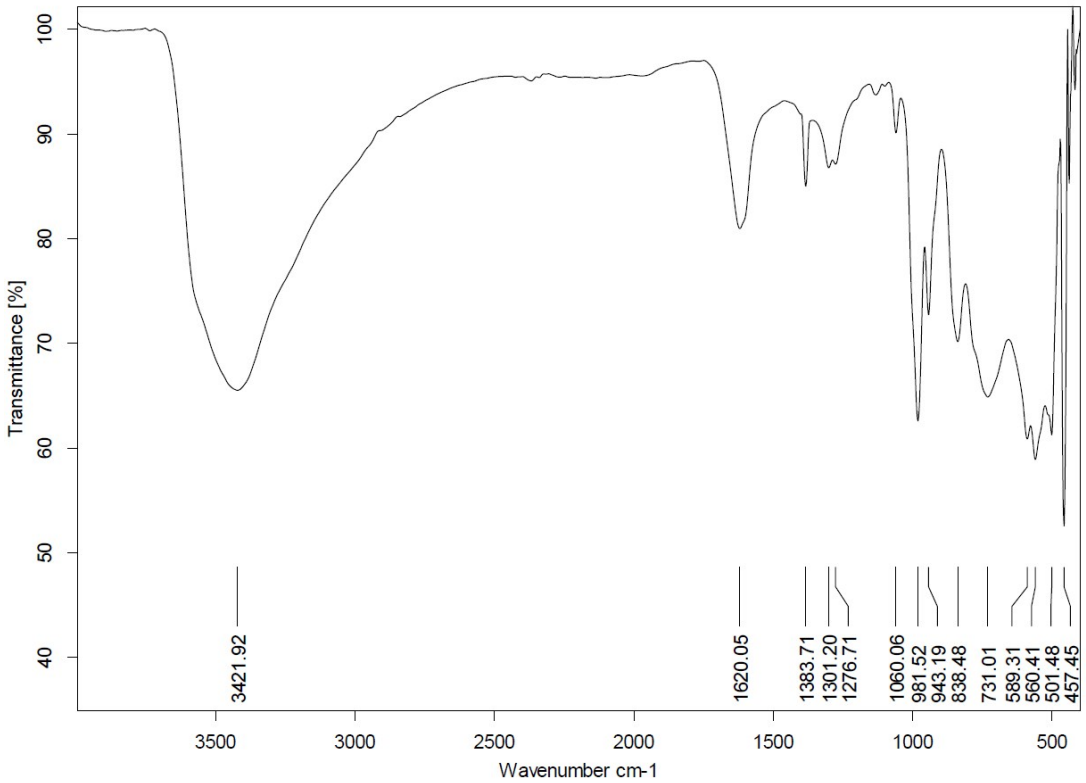


Fig. S1. FT-IR spectrum of the $K_5Mn^{IV}V_{11}O_{32}$ manganesepolyoxovanadate compound.

***IR*** *data (solid/KBr pellet,* $cm^{-1}$*):* $K_5Mn^{IV}V_{11}O_{32}$ : 982,943(*vs*) (V=$O_{term}$), 837, 589, 560 (*m*) (V-O-$V_{as}$), 731 (*s*).

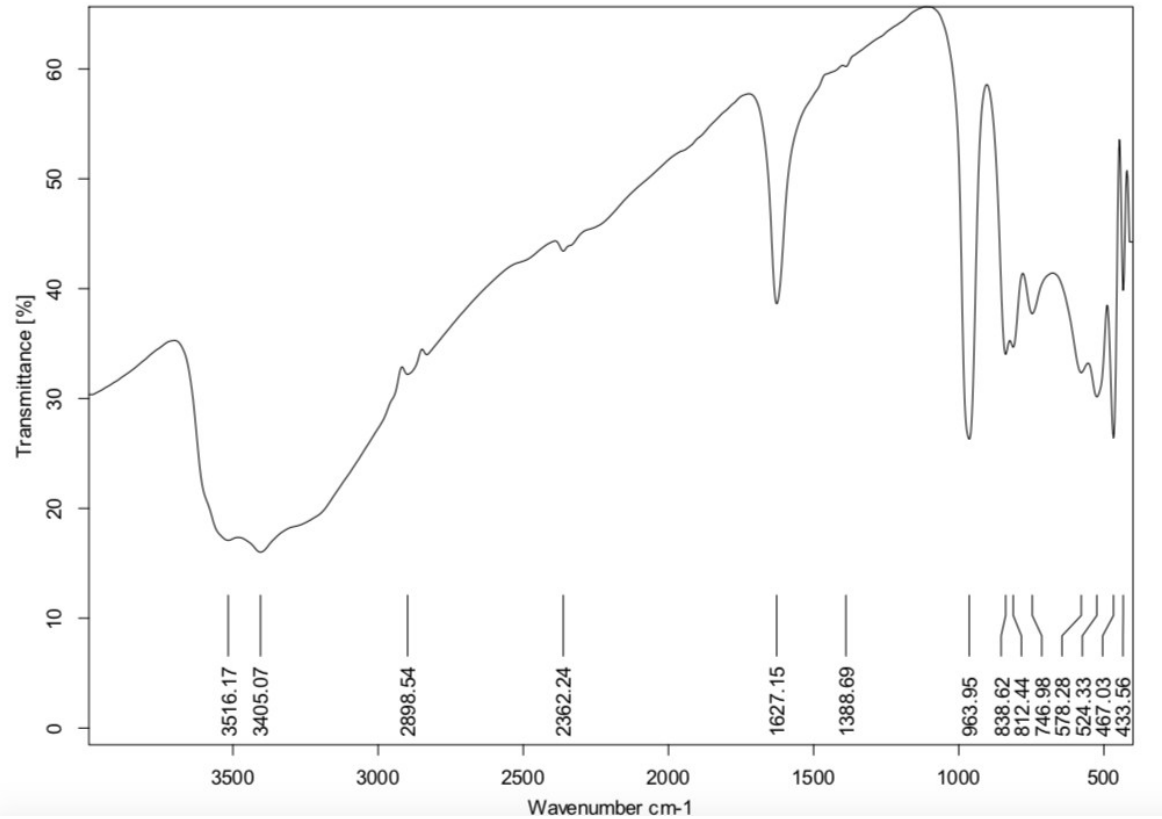


Fig. S2. FT-IR spectrum of the $K_7Mn^{IV}V_{13}O_{38}$ manganesepolyoxovanadate compound. ***IR*** *data (solid/KBr pellet, cm$^{-1}$): 964(s) (V=$O_{term}$), 839,812,578, 524 (V-O-$V_{as}$),747 (s) (Mn-O-V).*

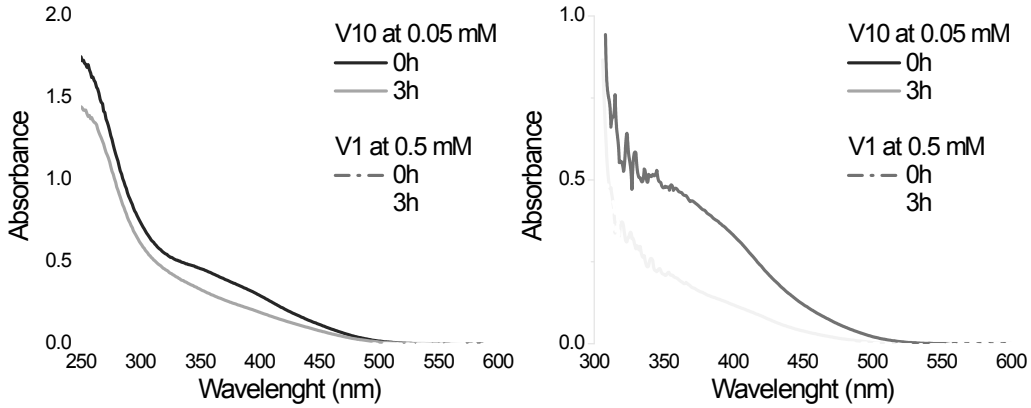


Figure S3. UV/vis spectra of decavanadate (V10, 0.05 mM) and vanadate (V1, 0.5 mM) after 0 and 3 hours incubation in water (left panel) as well as on the microbiological medium (right panel).

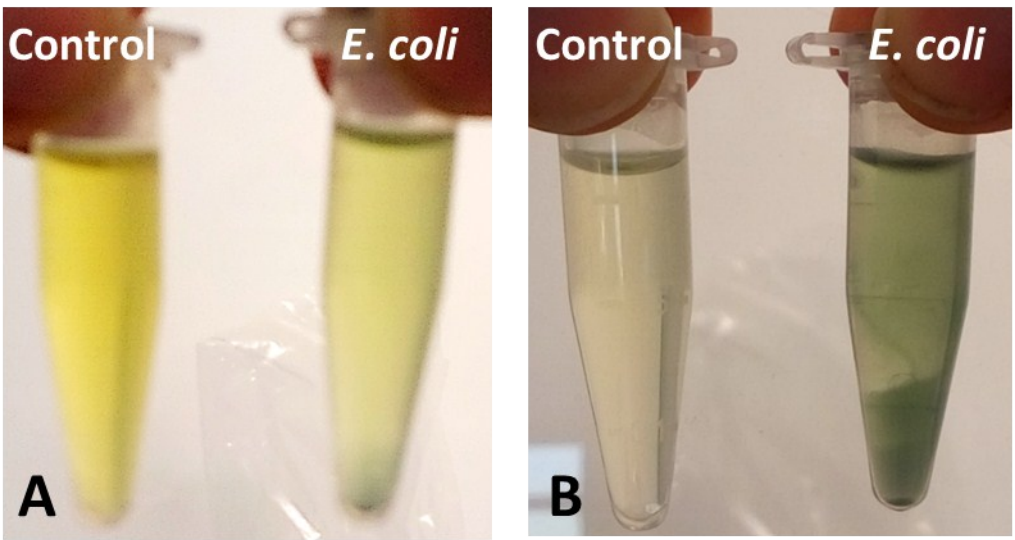


Figure S4. Decavanadate $V_{10}$ concentration 1 mM (panel A) and vanadate $V_1$ concentration 10 mM (panel B), in culture medium LB, after 24 hours incubation at 37ºC.

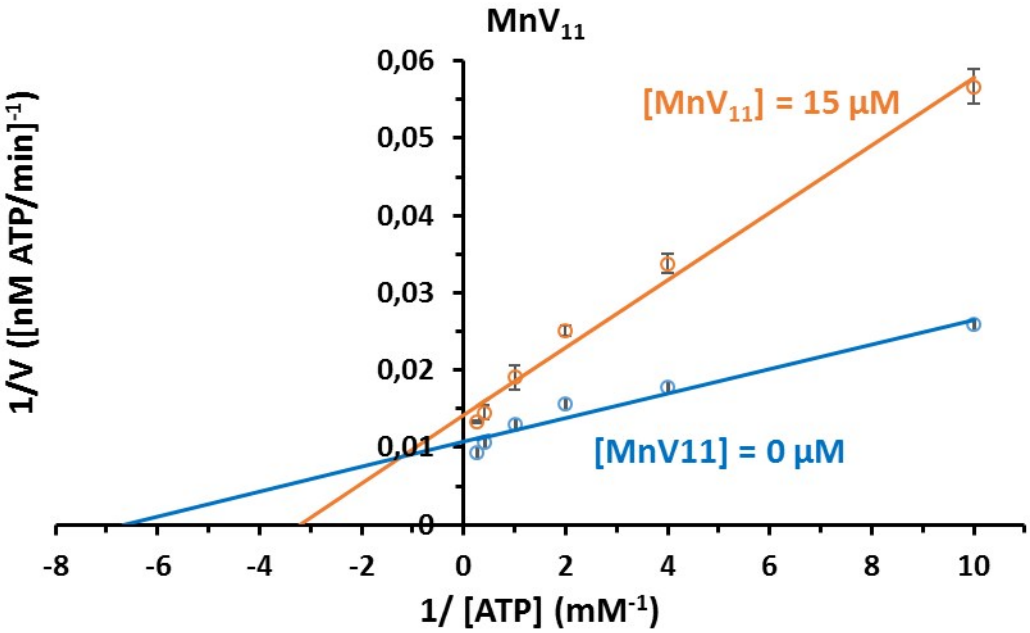


Figure S5. Lineweaver-Burk plot of $Ca^{2+}$-ATPase activity in the absence (blue) and in the presence (orange) of 15 µM of the polyoxometalate $MnV_{11}$, used for determining the type of enzyme inhibition. The POV presented a mixed type of inhibition. Data are plotted as means ± SD. The results shown are the average of triplicate experiments.

**Table S1.** Antibacterial activity (MIC) of POMs alone, POM-hybrids and nanocomposites against *E. coli*.

| POM/POM-hybrid | MIC (μg/ml) | Ref. |
|---|---|---|
| **Polyoxometalate alone:** | | |
| $[V_{10}O_{28}]^{6-}$ | 50 | 48 |
| $[P_5W_{30}]^{14-}$ | >265 | 62 |
| $[P_2W_{15}V_3]^{6-}$ | >265 | 62 |
| $[P_2O_7Mo_{18}]^{6-}$ | >265 | 62 |
| $[As_2Mo_{18}]^{6-}$ | >265 | 62 |
| **Organic-inorganic-POM: organoantimony-polyoxotungstate:** | | |
| $[(PhSb^{III})_4(A\text{-}\alpha\text{-}Ge^{IV}W_9O_{34})_2]^{12-}$ | 80 | 45 |
| $[(PhSb^{III})_4(A\text{-}\alpha\text{-}P^{V}W_9O_{34})_2]^{10-}$ | 110 | 45 |
| $[\{2\text{-}(Me_2NCH_2C_6H_4)Sb^{III}\}_3(B\text{-}\alpha\text{-}As^{III}W_9O_{33})]^{3-}$ | 130 | 45 |
| $[(PhSb^{III})\{Na(H_2O)\}As^{III}_2W_{19}O_{67}]^{11-}$ | 500 | 46 |
| $[(PhSb^{III})_2As^{III}_2W_{19}O_{67}]^{10-}$ | 250 | 46 |
| $[(PhSb^{III})_3(B\text{-}\alpha\text{-}As^{III}W_9O_{33})_2]^{12-}$ | 125 | 46 |
| **Quinolone-based drug-POM:** | | |
| $[Co^{II}(C_{19}FH_{22}N_3O_4)_3][C_{19}FH_{23}N_3O_4][HSiW_{12}O_{40}]$ | 2.4 | 47 |
| **Nanocomposite: Bamboo charcoal-POM:** | | |
| BC/POM | 4 | 50 |
| **Polymer-POM: PVA/PEI-POM:** | | |
| PVA-PEI-$H_5PV_2Mo_{10}O_{40}$ | 2 | 49 |
| **Chitosan-POM:** | | |
| CTS-$Ca_3V_{10}O_{28}$ | 12.5 | 48 |
| **Polyoxometalate ionic liquids:** | | |
| $[N(C_6H_{13})_4]_8[\alpha\text{-}SiW_{11}O_{39}]$ | 1000 | 51 |
| $[N(C_7H_{15})_4]_8[\alpha\text{-}SiW_{11}O_{39}]$ | 25 | 51 |
| $[N(C_8H_{17})_4]_8[\alpha\text{-}SiW_{11}O_{39}]$ | 50 | 51 |