Supporting information

Reasons for enhanced activity of doxorubicin on co-delivery with octa(3-aminopropyl)silsesquioxane

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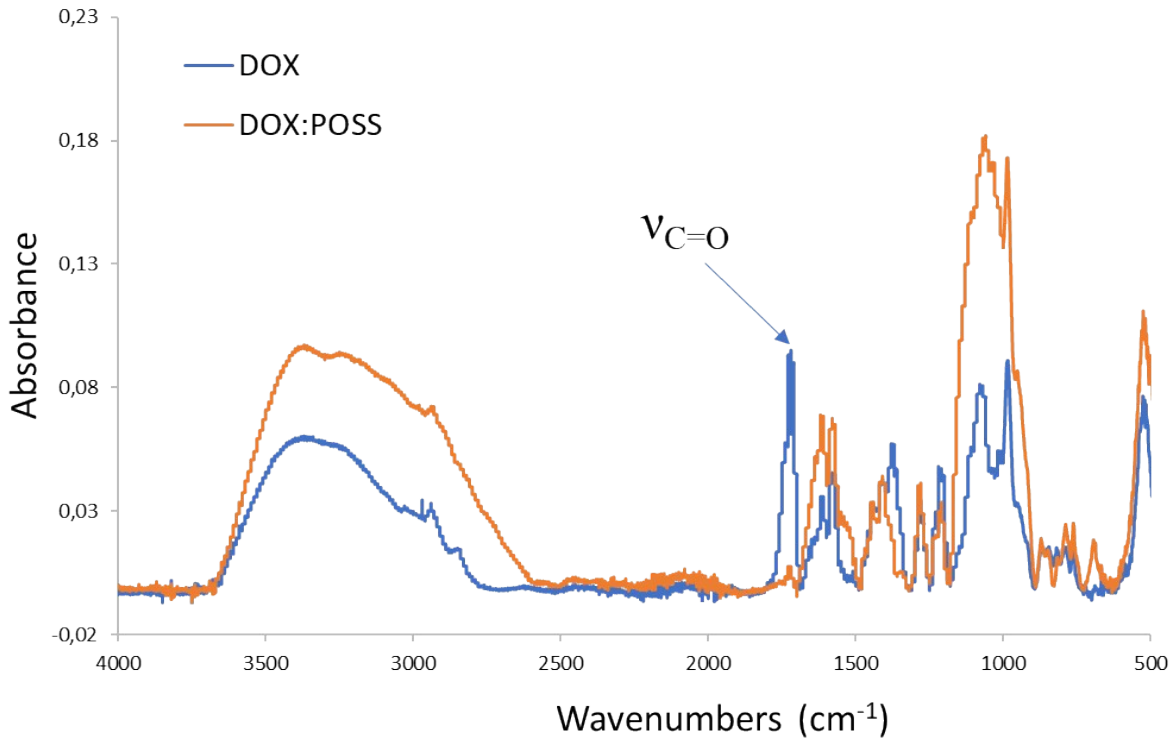


Fig. 1. FTIR spectra of DOX-POSS and DOX.

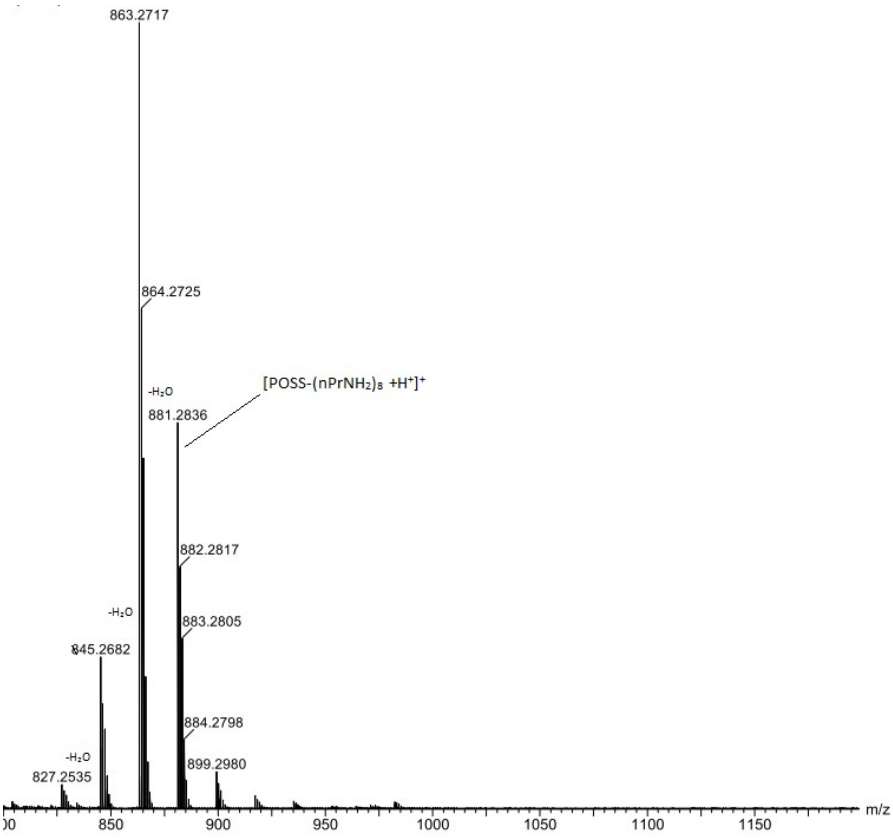


Fig. 2. ESI MS spectrum of POSS after 24h incubation (37°C) in H_2O.

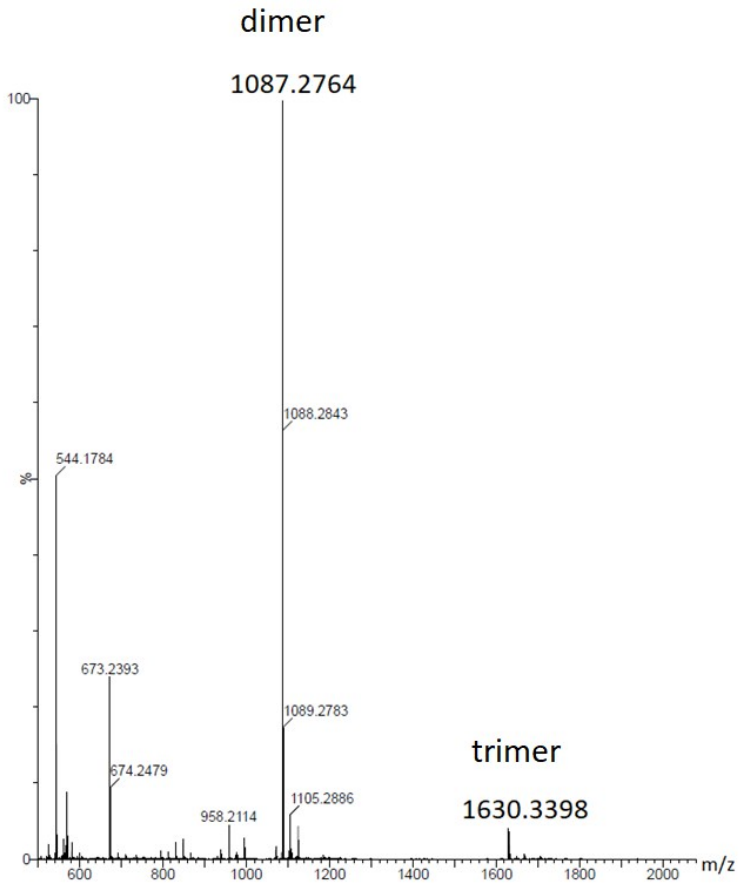


Fig. 3. ESI MS spectrum of doxorubicin after 24h incubation (37°C) in H_2O.

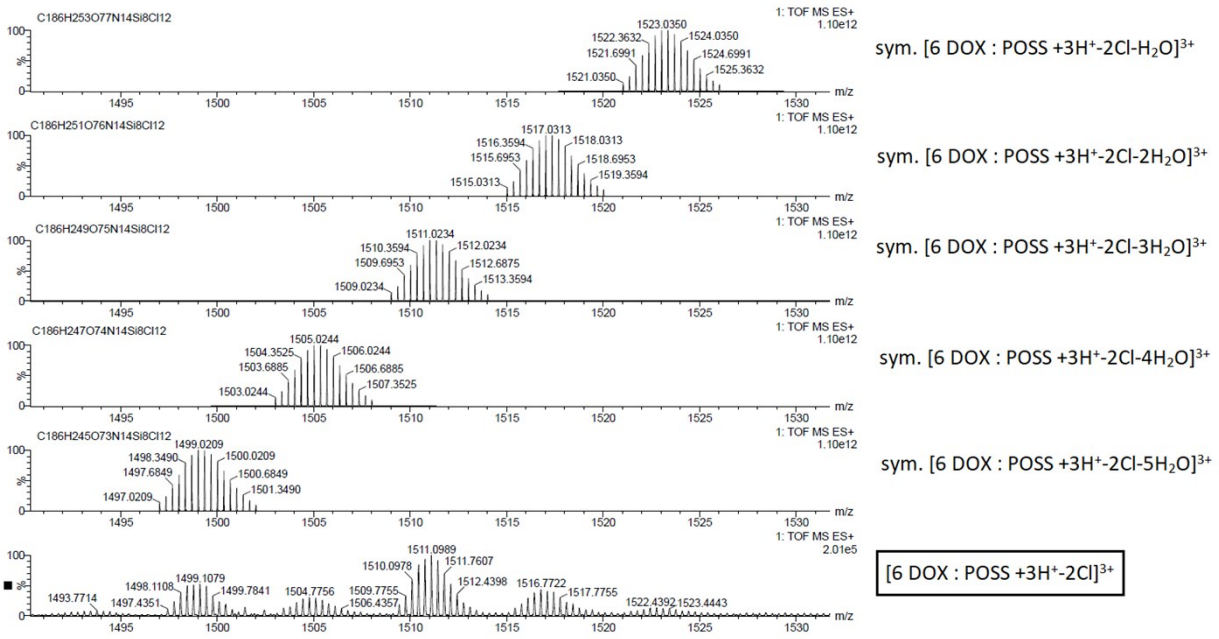
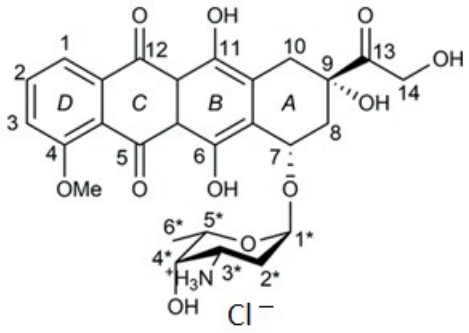


Fig. 4. ESI MS experimental spectrum of DOX-POSS complex ([6DOX-POSS+3H$^+$-2Cl]$^{3+}$) and simulated isotopic patterns.

Table 1. Experimental and theoretical masses of DOX:POSS complexes

6 DOX:POSS	**[6 DOX·HCl+POSS(HCl)$_8$-2HCl-3H$_2$O+H$^+$]**	**cal. 4527.11 Da**	**4527.29 Da**
7 DOX:POSS	[7 DOX·HCl+POSS(HCl)$_8$-2HCl-3H$_2$O+H$^+$]	cal. 5106.08 Da	5106.45 Da
8 DOX:POSS	[8 DOX·HCl+POSS(HCl)$_8$-2HCl-3H$_2$O+H$^+$]	cal.5687.07 Da	5688.59 Da
9 DOX:POSS	[9 DOX·HCl+POSS(HCl)$_8$-2HCl-3H$_2$O+H$^+$]	cal. 6267.05 Da	6266.74 Da
10 DOX:POSS	[10 DOX·HCl+POSS(HCl)$_8$-2HCl-3H$_2$O+H$^+$]	cal. 6847.03 Da	6847.85 Da
11 DOX:POSS	[11DOX·HCl+POSS(HCl)$_8$-2HCl-3H$_2$O+H$^+$]	cal. 7426.01 Da	7426.05 Da



Structure 1. Doxorubicin with labelled carbon atoms

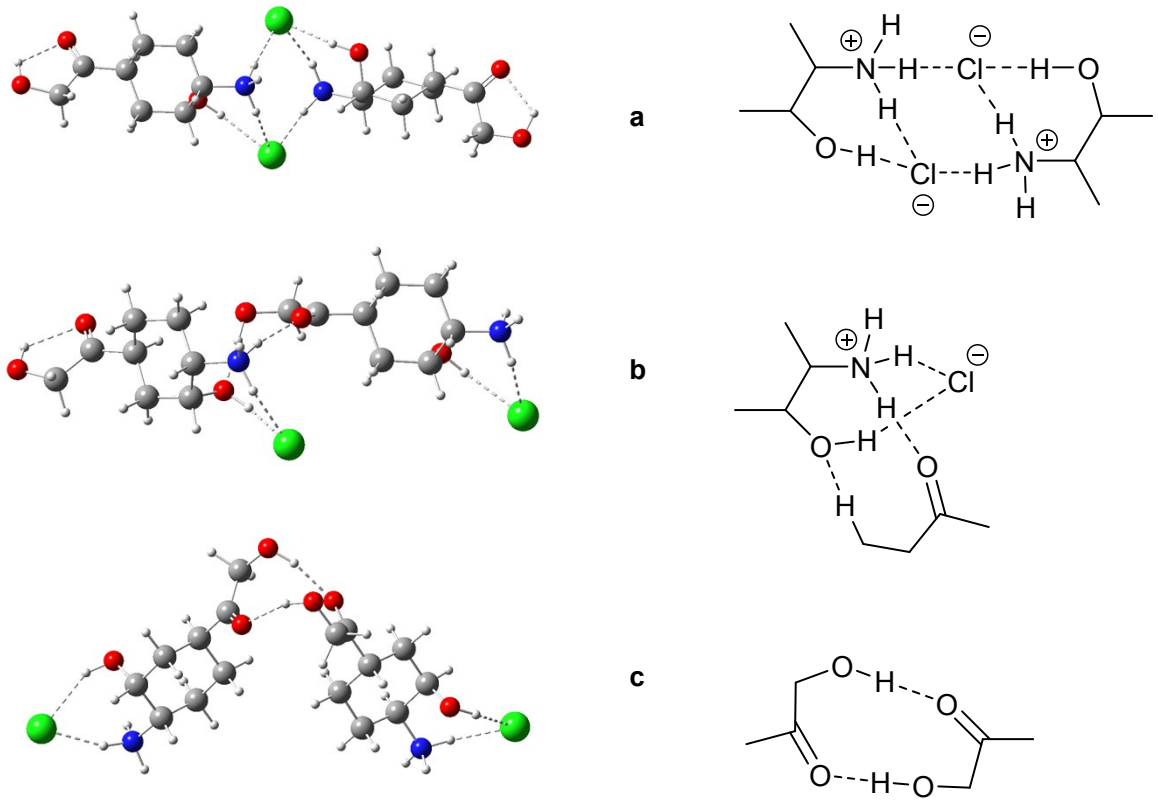


Fig. 5. Three possibilities of complex formation of two molecules of 1.

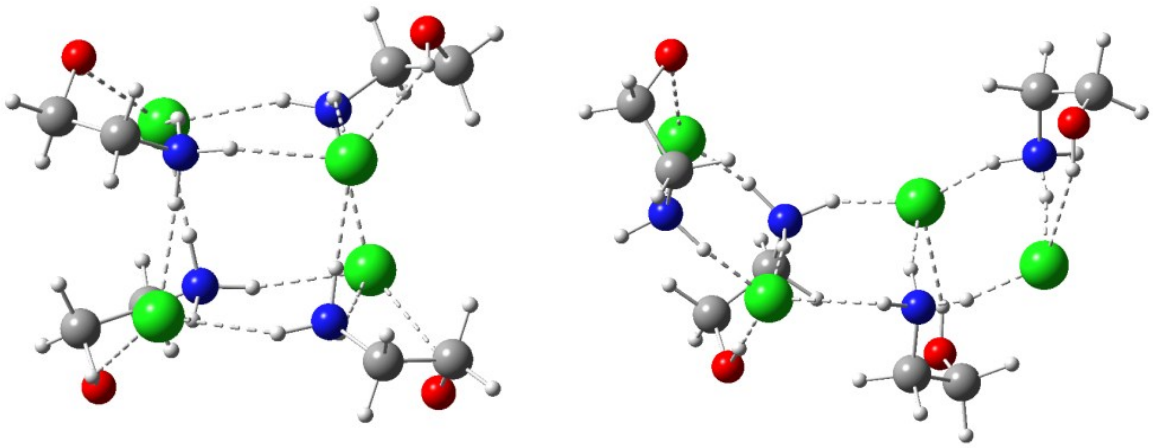


Fig. 6. Cage and ladder-like tetramers of hydroxy amine hydrochloride optimized by PM3 method.

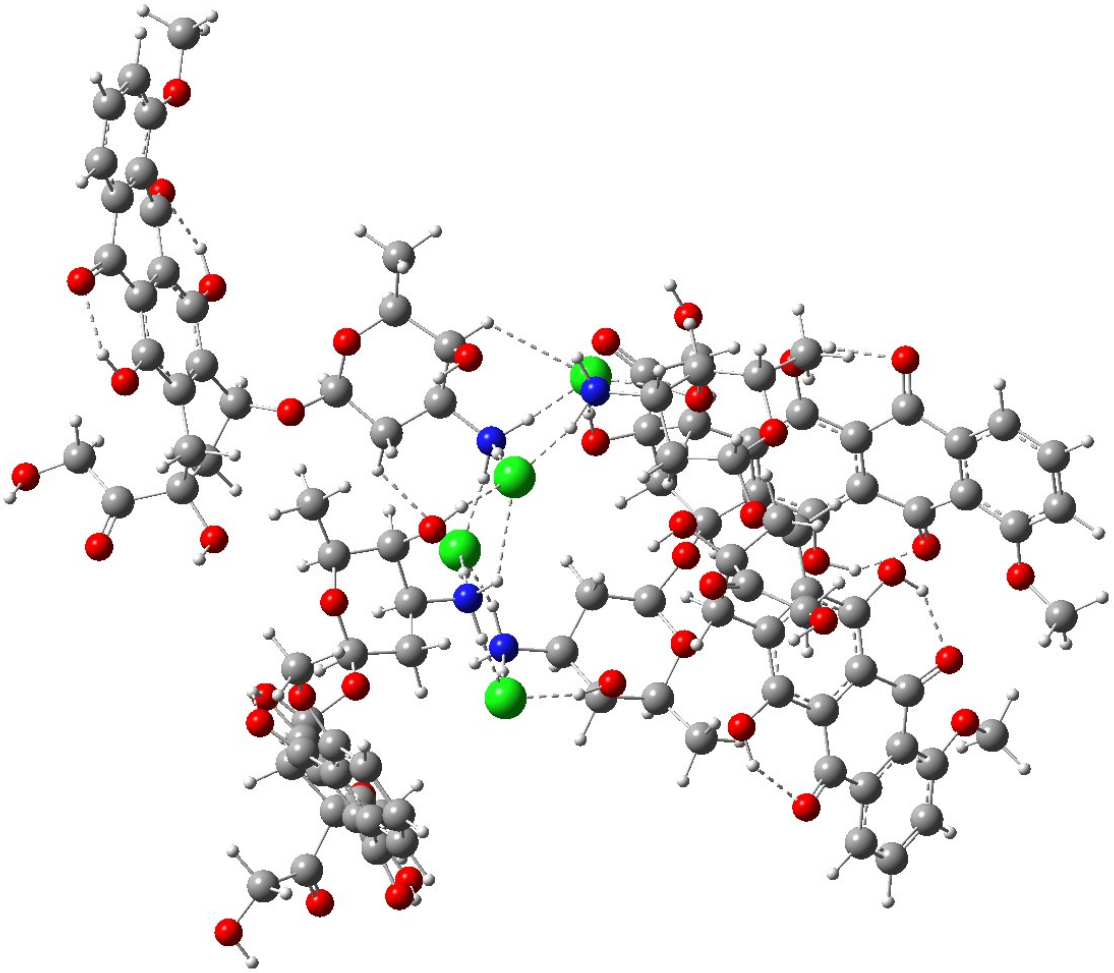


Fig. 7. Ladder tetramer of doxorubicin hydrochloride (PM3 optimized).

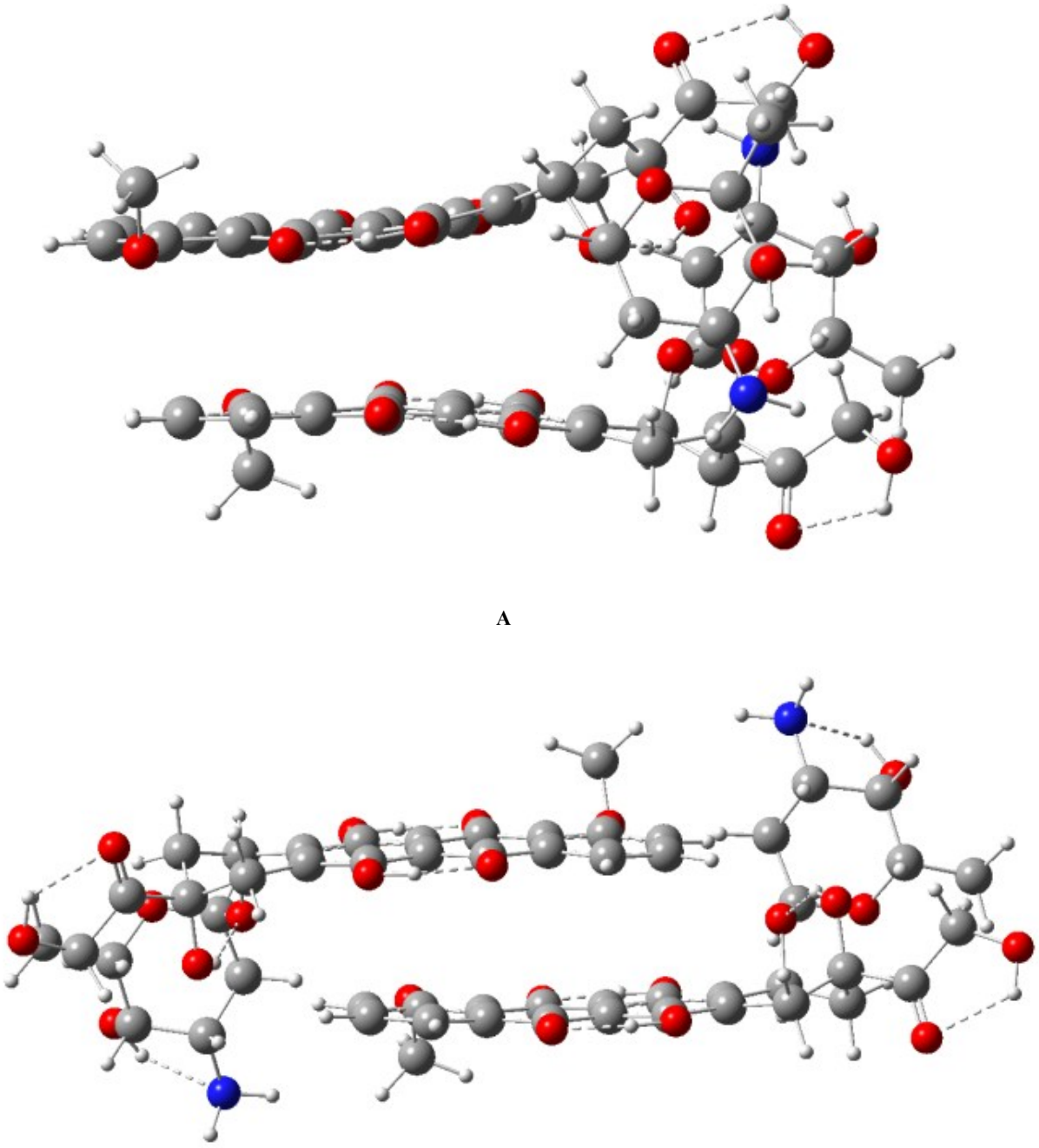


Fig. 8. B3LYP-GD3/6-31+G(d) optimized doxorubicin π-stacking dimer structures: (A) paralel, (B) antiparallel.

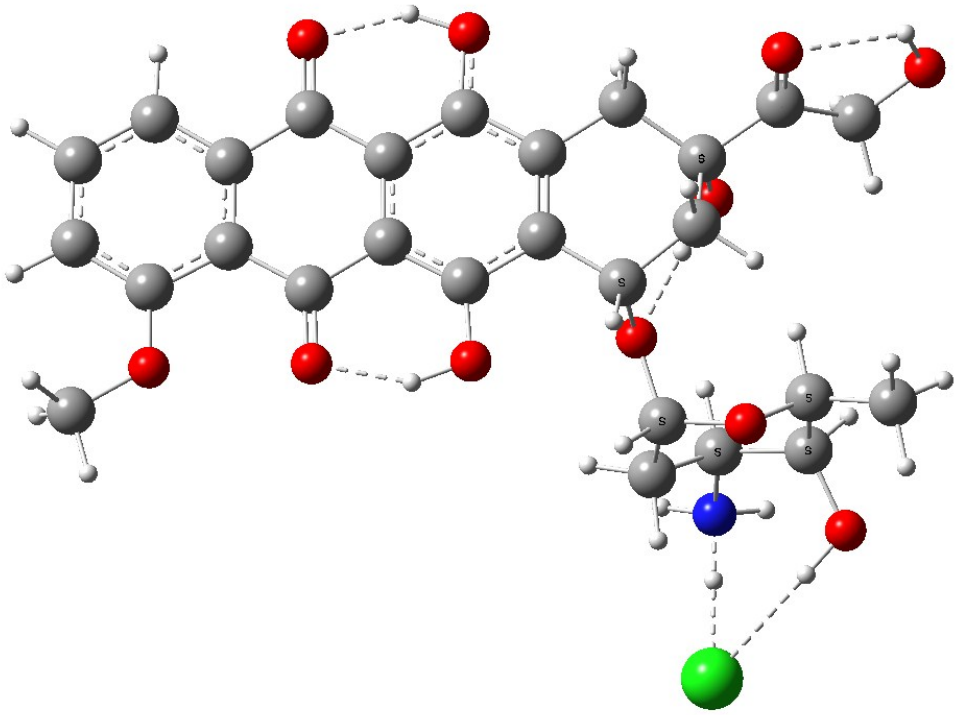


Fig. 9. Doxorubicin hydrochloride, the most stable conformer (by ca 0.7 kcal/mol more stable than the second stable one) optimized with B3LYP/6-31+G(d). The hydrogen bonds are marked with dashed lines.

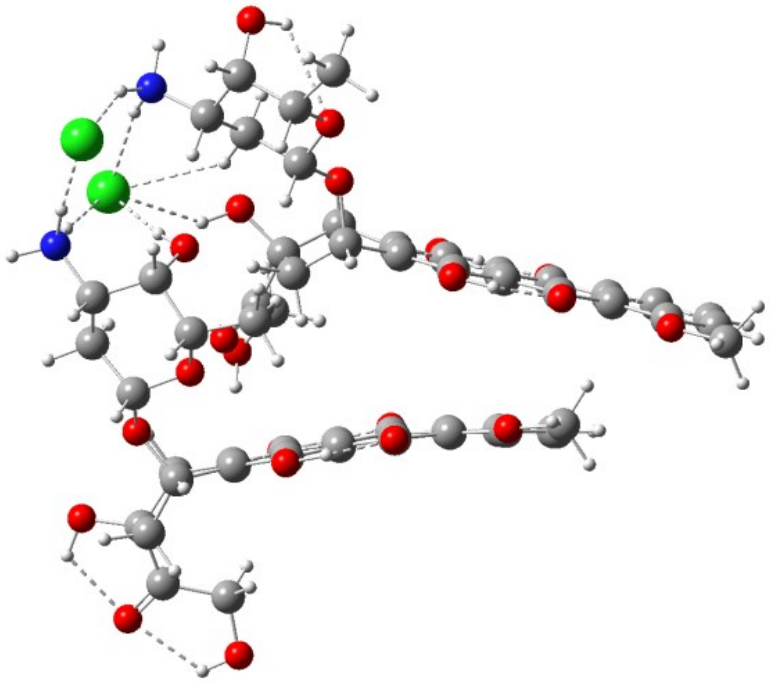


Fig. 10. Conformation of the doxorubicin hydrochloride dimer linked through an $NH^{3+}Cl^{-}$ bridge and additionally bound by intramolecular parallel π-π stacking

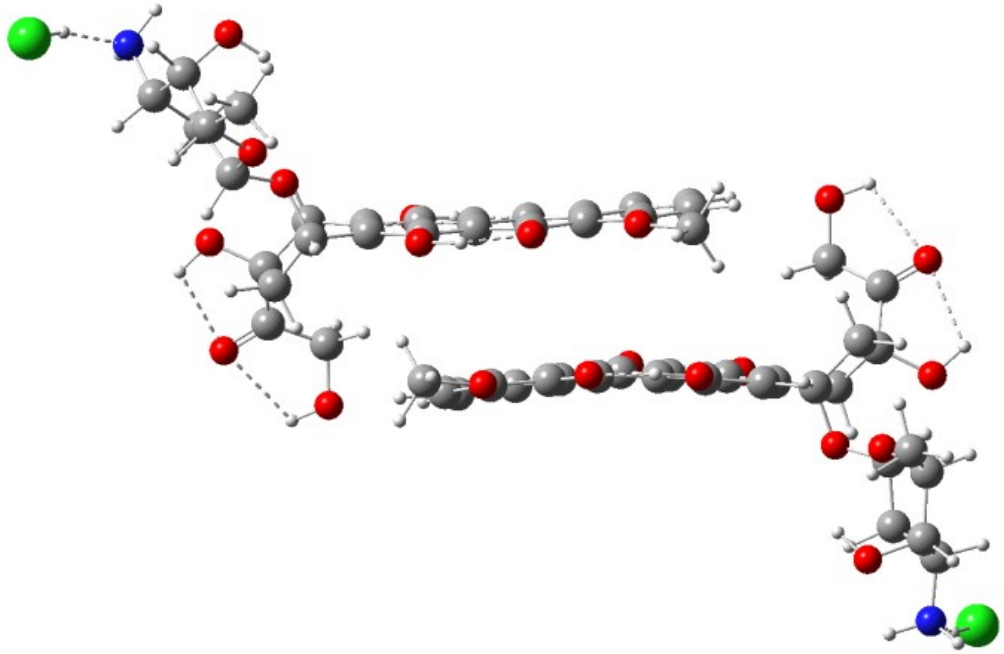


Fig. 11. Conformation of the doxorubicin hydrochloride dimer bound by antiparallel π-π stacking.

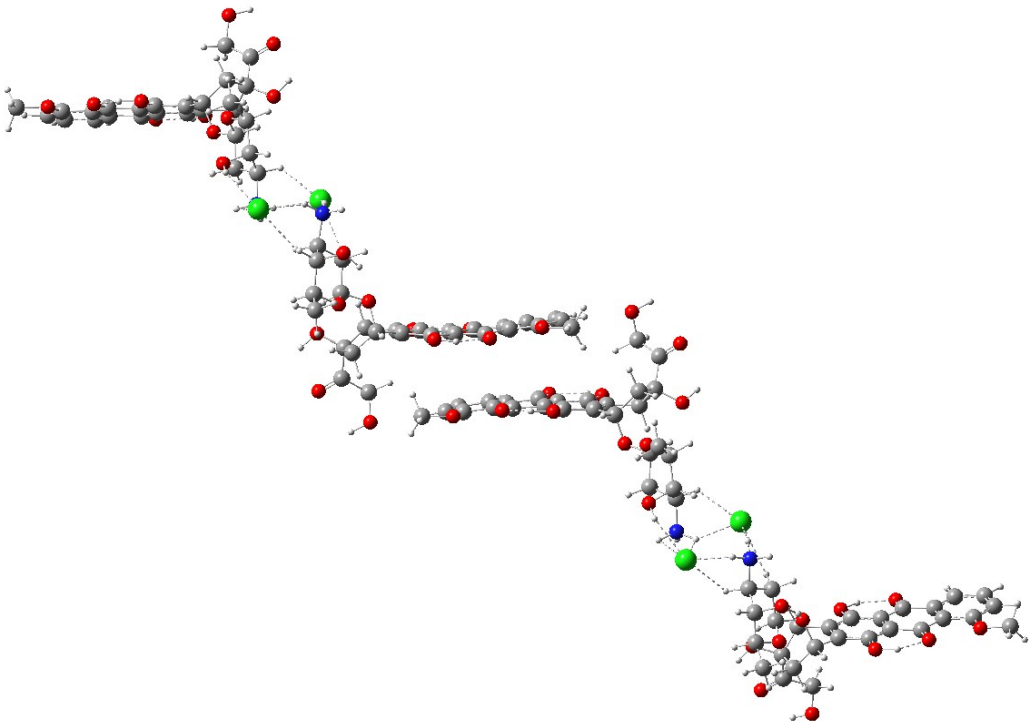


Fig. 12. PM7 optimized structure of doxorubicine hydrochloride tetramer.

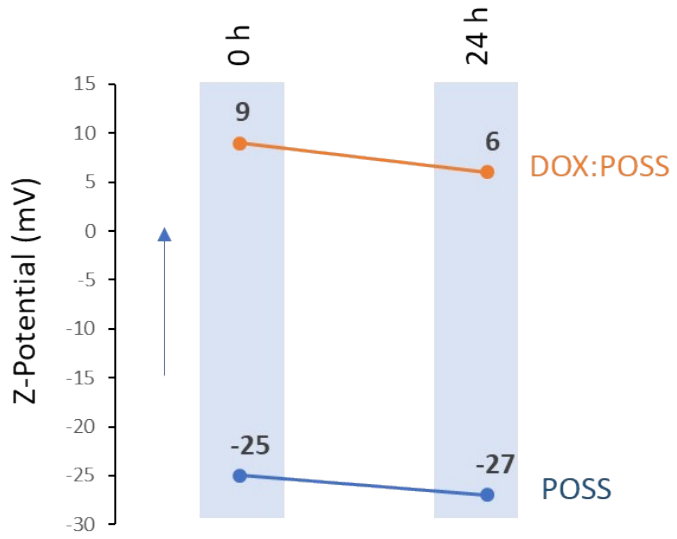


Fig. 13. Z-potential of DOX:POSS (8:1) and POSS at 0h and 24h in PBS at 37°C.

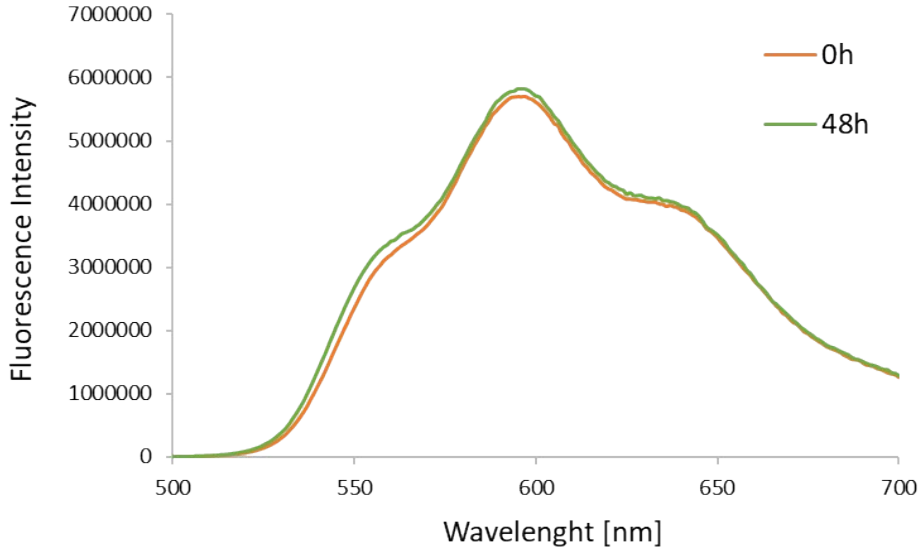


Fig. 14. Fluorescence emission spectra of complex DOX:POSS (8:1) in PBS with time at 37°C.