causing the particle to migrate. The particle movement is a function of particle size, its overall net charge and the field strength. This movement, and the subsequent collosions, can lead to the agglutination of the cells.

This possibility was discussed and rebutted previously by Krueger's group[18] on the following grounds: a) the lethal effect of bacterial cells was reversed by exposing the cells 'to intense light in the visible spectrum' and b) 'the time required to produce a lethal effect was much less than the minimal time for agglutination predicted by Smoluchowski equation'. We are unable to estimate the relevance of the first claim since no pertinent data such as conditions of irradiation, extent of reversal etc. were provided. Furthermore, we consider that the application of the Smoluchowski equation[19] for agglutination due to an external electric field is entirely irrelevant. This equation refers to Brownian motion and does not make any provision for an external factor.

Recently the same group emphasized, as crucial, the necessity of grounding and stirring the solutions exposed to AGNI. This requirement is supposed to ensure adequate contact of ions and cells at the air-water surface and to avoid conditions of minimal negative ion interaction, as accumulated surface charge would repel negative ions[20]. We find this explanation hardly acceptable because the target solutuion is an electrolyte with a good conductivity which cannot accumulate surface changes. If grounding is necessary, it is for creating an effective electric field.

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Indirect ligand attachment to metal centers via hydrogen bonding to coordinated water molecules

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Summary. The 1:1 complex between triphenyltin chloride and **I** has a structure involving the indirect attachment of the ligand to the metal center, via hydrogen-bonding to a coordinated water molecule.

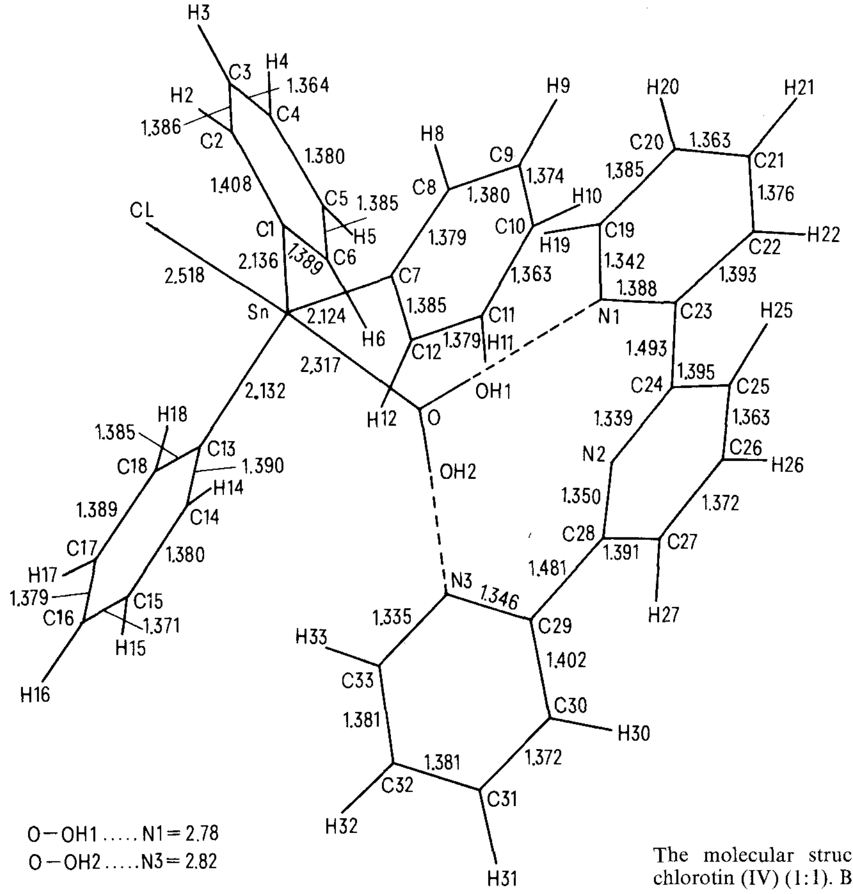
Coordinated water molecules can hydrogen bond to planar tridentate chelating agents and hold them in close proximity to a tin (IV) metal ion center.

We describe the synthesis of a series of organotin complexes which contain coordinated water molecules displaying a hitherto unreported type of bridging behavior.

The planar tridentate chelating agents 2,2′:6′,2″-terpyridyl and 3-(2-(1,10-phenanthrolyl))-5,6-diphenyl-1,2,4-triazine (**I**)[2] form 1:1 complexes with triphenyltin chloride and triphenyltin isothiocyanate[3].

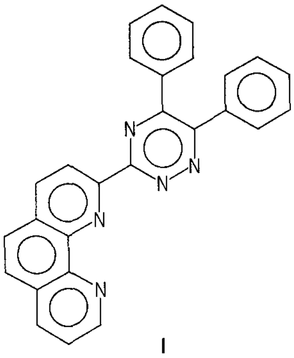
Crystallographic data

Compound	Lattice	Space group	Cell dimensions		Final R_f-value
$Ph_3SnNCS \cdot terpy \cdot H_2O$	Triclinic	$P\bar{1}$	a = 10.326 Å b = 10.739 Å c = 15.880 Å	α = 105.04° β = 97.14° γ = 111.5°	0.026
$Ph_3SnCl \cdot L \cdot H_2O$ (L = I)	Orthorhombic	$Pca2_1$	a = 19.195 Å b = 9.144 Å c = 21.642 Å	α = 90° β = 90° γ = 90°	0.029



The molecular structure of (2,2′:6′,2″-terpyridyl)-aquatriphenylchlorotin (IV) (1:1). Bond lengths in Å.

These complexes all crystallize out with 1 molecule of water. At first, it was considered that the compounds were examples of 7-coordination at tin (IV), in which case these would have represented the 1st examples of a 7-coordinate tin (IV) atom bound to 3 organic groups. However, the results of complete X-ray structural investigations on 3 of the compounds ($Ph_3SnCl \cdot terpy \cdot H_2O$[4], $Ph_3SnNCS \cdot terpy \cdot H_2O$[5] and $Ph_3SnCl \cdot L \cdot H_2O$ (L = I)[6]) have shown that in each instance the tin atom is only 5-coordinate, being bound to the 3 phenyl groups, chloride (or the isothiocyanato group) and the oxygen atom of a water molecule. The tridentate ligands are hydrogen-bonded to the coordinated water molecule, and not directly bound to the metal atom at all. The structures of all 3 of the complexes investigated were found to be very similar, that of the complex formed between terpyridyl and triphenyltin chloride is illustrated in the figure, and some crystallographic data for the other 2 complexes are presented in the table.



I

Although this type of bridging behavior by a coordinated water molecule does not appear to have been reported previously, it may well prove to be of fairly common occurrence in the coordination chemistry of both main group and transition metals. In particular, it is likely to be of major significance in biological systems, providing an alternative mechanism for the interaction of metal ions with the amino acid side chain groups of proteins.

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