

Title: **Synthesis of new polynuclear gold(I) compounds: study of application as sensors and potential luminescent hydrogels.**

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Increasingly, organometallic compounds containing alkyne groups are an important focus in chemistry research. Specially, alkynyl-gold(I) compounds are an interesting group of complexes due to its wide range of applications like luminescence or its potential application as therapeutic agents against many diseases such as cancer.

In the work presented herein, I report the synthesis of gold(I) compounds with an alkynyl group and a phosphine with variable solubility in water. I used tripropargylamine, 4-ethynylaniline and 4-ethynylpyridine as alkynyl groups and 1,3,5-triaza-7-phosphaadamantane (PTA), 3,7-diacetyl-1,3,7-triaza-5-phosphabicyclo[3.3.1]nonane (DAPTA), triphenylphosphine-3,3',3''-trisulfonic acid trisodium salt (TPPTS) and 9,9-dimethyl-4,5-bis(diphenylphosphino)xanthene (XANTPHOS) as phosphine groups. Once obtained the products, they were characterized using different techniques: infrared spectrophotometry, ^1H and ^{31}P -NMR and mass spectrometry. Finally, I studied their aggregation in water solution through dynamic light scattering, optical microscopy and ^1H -NMR along the time and to study their application as sensors I performed molecular recognition studies with metallic cations such as silver(I) and copper(II).

Keywords: Gold(I), alkynyl, organometallic, aggregation, luminescence, sensor.