



<b>B</b> 5 10.81 Boron	<b>C</b> 6 12.01 Carbon	<b>N</b> 7 14.01 Nitrogen	<b>O</b> 8 16.00 Oxygen	<b>F</b> 9 19.00 Fluorine
<b>Al</b> 13 26.98 Aluminum	<b>Si</b> 14 28.09 Silicon	<b>P</b> 15 30.97 Phosphorus	<b>S</b> 16 32.07 Sulfur	<b>Cl</b> 17 35.45 Chlorine
<b>Cu</b> 29 63.55 Copper	<b>Zn</b> 30 65.39 Zinc	<b>Ga</b> 31 69.72 Gallium	<b>Ge</b> 32 72.61 Germanium	<b>As</b> 33 74.92 Arsenic
<b>Ag</b> 47 107.87 Silver	<b>Cd</b> 48 112.41 Cadmium	<b>In</b> 49 114.82 Indium	<b>Sn</b> 50 118.71 Tin	<b>Sb</b> 51 121.76 Antimony
<b>Au</b> 79 196.97 Gold	<b>Hg</b> 80 200.59 Mercury	<b>Tl</b> 81 204.38 Thallium	<b>Pb</b> 82 207.2 Lead	<b>Bi</b> 83 208.98 Bismuth
			<b>Po</b> 84 (209) Polonium	<b>At</b> 85 (210) Astatine

# ICHAC-9

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## PO-10

New Substituted Indazole and Condensed Pyrazole  
Bisphosphonates

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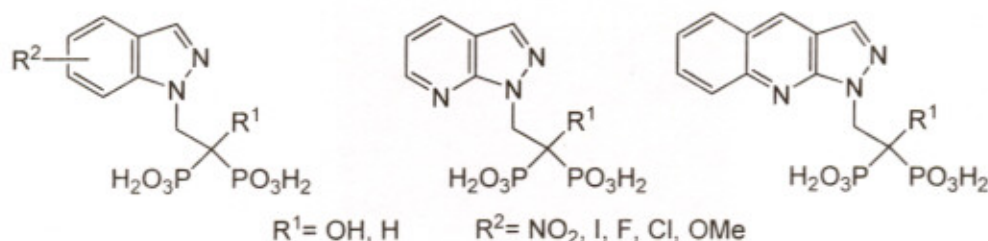
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Bisphosphonates (BPs) are potent antiresorptive agents used successfully in the treatment of several bone diseases associated with high bone resorption, such as Paget's disease, osteoporosis and bone metastases. More recently, it has been shown that these compounds were able to inhibit metastases proliferation in prostate and breast cancer. In addition, functional BPs have been also used as novel ligands for well-defined radioactive metal complexes for both imaging and radiotherapy applications, and in the treatment of metal intoxication.<sup>1</sup>

The aim of this work is to extend the previous studies on indazolebisphosphonates<sup>2</sup> to other condensed pyrazole derivatives and performs modification on the previous indazolebisphosphonates, by the introduction of some different groups such as nitro, methoxy, halogens, in order to obtain new BPs with potential biological and radiotherapy applications.

Herein, we report the synthesis and characterization of a series of new 1-hydroxybisphosphonates and aminobisphosphonates derived from indazole and condensed pyrazoles, such as pyrazolo[3,4-*b*]quinolines, 1H-pyrazolo[3,4-*b*]pyridines. Crystal structures of bisphosphonates were determined by X-ray crystallography. The new BPs were evaluated as ligands for complexation with radionuclides and submitted to studies *in vitro* (hydroxyapatite binding studies simulating bone mineral uptake).



[1]

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<sup>1</sup> Zhang, S.; Gangal, G.; Uludag, H. *Chem. Soc. Rev.*, 2007, 36, 507.

<sup>2</sup> Teixeira, F.C.; Antunes, I.F.; Curto, M.J.M.; Neves, M.; Gano, L. *Medicinal Chemistry in the 21st Century*, 2006, P89.