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(54) **Title**: THERAPEUTIC AGENTS FOR REGULATING SERUM PHOSPHORUS

(57) **Abstract**: Methods for modulating serum phosphorus levels are described, wherein calcimimetic agents are administered to a subject in need thereof. In one embodiment, the compound is cinacalcet, and in other embodiments the compound is comprised of a contiguous sequence of subunits, X_1,- X_2 - X_3 - X_4 - X_5 - X_6 - X_7, wherein the X_1 subunit comprises a thiol-containing moiety and the distribution of charge on the X_2-X_7 subunits. The compound, when administered at selected times to a patient undergoing dialysis, lowers serum phosphorus levels, relative to pre-dosing levels, and achieves a sustained reduced level for a period of time after administration.