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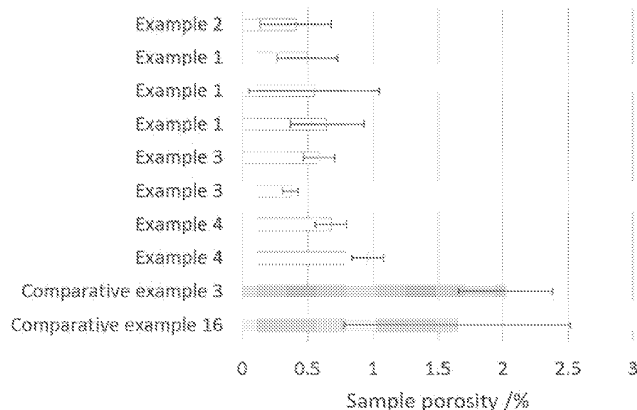


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(54) Title: A NICKEL-FREE PLATINUM ALLOY COMPOSITION

Figure 1



(57) Abstract: A platinum alloy composition consisting, in weight percent, of: 0.0 to 5.0 gold, 0.0 to 2.5 cobalt, 0.0 to 3.0 copper, 0.0 to 5.0 iron, 0.0 to 2.75 gallium, 0.0 to 3.0 indium, 0.0 to 5.0 iridium, 0.0 to 5.0 manganese, 0.0 to 5.0 palladium, 0.0 to 5.0 rhenium, 0.0 to 5.0 rhodium, 0.0 to 5.0 ruthenium, 0.0 to 3.0 tin, 0.0 to 5.0 silver, with the sum of platinum and iridium being 95.0 or more and incidental impurities, wherein the following equation is satisfied in which W_{Co} , W_{Cu} , W_{Fe} , W_{Ga} , W_{In} , W_{Ni} , W_{Pd} , W_{Sn} , W_{Rh} , W_{Ir} , W_{Au} , W_{Ru} , W_{Re} , W_{Ag} and W_{Mn} are the weight percent of cobalt, copper, iron, gallium, indium, nickel, palladium, tin, rhodium, iridium, gold, ruthenium, rhenium, silver and manganese in the alloy respectively $60 + W_{Pd} * 2.5 + W_{Rh} * 3.4 + W_{Ir} * 6.455 + W_{Au} * 11.93 + W_{Ru} * 13.241 + W_{Cu} * 14.328 + W_{Re} * 16.6 + W_{Ni} * 16.9 + W_{Mn} * 18.48 + W_{Co} * 18.69 + W_{Fe} * 21.879 + W_{In} * 29 + W_{Sn} * 28.207 + W_{Ga} * 42.379 + W_{Ag} * 9.0 \geq 130$ and wherein the following condition is satisfied in which W_{Co} , W_{Cu} , W_{Fe} , W_{Ga} , W_{In} , W_{Ni} , W_{Pd} , W_{Sn} , W_{Mn} , W_{Ru} , W_{Ir} , W_{Rh} , W_{Au} , W_{Pt} , W_{Ag} and W_{Re} are the weight percent of cobalt, copper, iron, gallium, indium, nickel, palladium, tin, manganese, ruthenium, iridium, rhodium, gold, platinum, silver and rhenium in the alloy respectively $16.6 < -0.10406 * W_{Ag} - 0.1028 * W_{Co} - 0.1201 * W_{Cu} - 0.2113 * W_{Fe} - 0.3368 * W_{Ga} - 0.1125 * W_{In} - 0.1639 * W_{Ni} - 0.015 * W_{Pd} - 0.1959 * W_{Sn} + 17.276261 - 0.20 * W_{Mn} + 0.0678 * W_{Ru} + 0.035 * W + 0.045 * W_{Rh} -$

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$0.059*W_{Au} + 0.066*W_{Re} \leq 17.1$ and wherein the following equation is satisfied in which W_{Co} , W_{Cu} , W_{Fe} , W_{Ga} , W_{In} , W_{Ni} , W_{Pd} , W_{Sn} , W_{Mn} , W_{Ru} , W_{Ir} , W_{Rh} , W_{Au} , W_{Ag} and W_{Re} are the weight percent of aluminium, cobalt, copper, iron, gallium, indium, nickel, palladium, tin, titanium, manganese, ruthenium, iridium, rhodium, gold, silver and rhenium in the alloy respectively $4.22W_{Ag}^2 + 0.041W_{Au}W_{Co} + 0.122W_{Au}W_{In} + 1.96W_{Au}W_{Ni} + 1.87W_{Au}W_{Sn} + 0.903W_{Au}^2 + 1.74W_{Co}W_{Ga} + 13.4W_{Co}W_{In} + 1.24W_{Co}W_{Mn} + 5.04W_{Co}W_{Sn} + 1.02W_{Co}^2 + 8.97W_{Cu}W_{Fe} + 1.74W_{Cu}W_{Ga} + 4.38W_{Cu}W_{In} + 1.16W_{Cu}W_{Mn} + 0.491W_{Cu}W_{Ni} + 3.69W_{Cu}W_{Sn} + 0.22W_{Cu}^2 + 1.68W_{Fe}W_{Ga} + 3.31W_{Fe}W_{In} - 1.26W_{Fe}W_{Mn} + 5.07W_{Fe}W_{Sn} + 0.199W_{Fe}^2 + 5.35W_{Ga}W_{In} + 0.086W_{Ga}W_{Mn} + 3.27W_{Ga}W_{Re} + 33.3W_{Ga}W_{Rh} + 4.56W_{Ga}W_{Ru} + 2.21W_{Ga}W_{Sn} + 29.0W_{Ga} + 8.49W_{Ga}^2 + 9.09W_{In}W_{Mn} - 0.28W_{In}W_{Ni} + 15.4W_{In}W_{Rh} + 0.992W_{In}W_{Ru} + 11.7W_{In} + 6.68W_{In}^2 + 0.863W_{Ir}^2 + 5.73W_{Mn}W_{Ni} - 0.02W_{Mn}W_{Ru} + 5.68W_{Mn}W_{Sn} + 18.4W_{Mn} - 0.89W_{Mn}^2 + 0.49W_{Ni}W_{Ru} + 0.186W_{Ni}^2 + 4.48W_{Re}W_{Sn} + 1.15W_{Re}^2 - 5.11W_{Rh}W_{Sn} + 2.04W_{Rh}^2 + 0.885W_{Ru}W_{Sn} + 1.28W_{Ru}^2 + 1.58W_{Sn} + 9.49W_{Sn}^2 + 11.6 \leq 100$.