again even under pyrolysis reaction conditions at a high temperature. However, when CaO or spent FCC catalyst is used alone as in the conventional technology, one kind of chlorine reaction product such as CaCl2 is formed to facilitate a chlorine dissociation reaction, and a large amount of decomposed HCl may be trapped in a pyrolysis oil or produce organic Cl by a re-reaction.

[36] In an exemplary embodiment, the slag composition may satisfy the following Equations 1 and 2:

[37] [Equation 1]

[38] 1 < iron oxide (wt%)/silicon oxide (wt%) < 3

[39] [Equation 2]

[40] 3 < iron oxide (wt%)/magnesium oxide (wt%) < 5

[41] wherein the iron oxide (wt%), the silicon oxide (wt%), and the magnesium oxide (wt%) refer to wt% of the iron oxide, the silicon oxide, and the magnesium oxide with respect to the total weight of the slag composition, respectively.

[42] When the slag composition satisfies the above Equations 1 and 2, the effect of reacting with chlorine to form a metal chloride is significantly improved, thereby minimizing chlorine in the produced waste plastic pyrolysis oil. Specifically, Equation 1 may be 1 < iron oxide (wt%)/silicon oxide (wt%) < 2.7, and Equation 2 may be 3.3 < iron oxide (wt%)/magnesium oxide (wt%) < 4.7. More specifically, Equation 1 may be 1.5 < iron oxide (wt%)/silicon oxide (wt%) < 2.5, and Equation 2 may be 3.5 < iron oxide (wt%)/ magnesium oxide (wt%) < 4.5.

[43] In an exemplary embodiment, the slag composition may include 5 wt% or less of the aluminum oxide. Specifically, the slag composition may include 4 wt% or less, more specifically 3 wt% or less of the aluminum oxide. When the range is satisfied, a chlorine removal effect may be further improved.

[44] In an exemplary embodiment, the slag composition may include 20 wt% or less of the silicon oxide. Specifically, the slag composition may include 18 wt% or less, more specifically 15 wt% or less of the silicon oxide. When the range is satisfied, a chlorine removal effect may be further improved.

[45] The slag composition may have a particle size of 5 to 200 μm, specifically 30 to 150 μm, or 60 to 80 μm.

[46] The slag composition may have a BET specific surface area of 0.5 to 10 m2/g, specifically 1 to 8 m2/g, or 3 to 5 m2/g. When CaO particles are added to a pyrolysis reactor to pyrolyze waste plastics, calcium oxide (CaO) reacts with hydrogen chloride in the reactor to produce CaCl2, and the produced ClCl2 is melted to cause de-fluidization. Due to the slagging, process efficiency is greatly lowered, for example, process operation is stopped. Since the slag composition of the present invention includes an iron oxide, a silicon oxide, an aluminum oxide, and/or a magnesium oxide,