Claims:

1. An additive composition for control and inhibition of polymerization of pyrolysis gasoline, wherein the composition consists of a combination of:
   (a) a phenol compound comprising a catechol compound; and
   (b) an amine selected from the group consisting of:
      (i) tri-isopropanol amine (TIPA);
      (ii) ethyl oxide treated derivative of tri-isopropanol amine (EO-TIPA);
      (iii) propyl oxide treated derivative of tri-isopropanol amine (PO-TIPA); or
      (iv) a mixture thereof;

   wherein the catechol compound comprises a tertiary butyl catechol (TBC);
   wherein the phenol compound and the amine are taken in a weight percent ratio varying from about 99.99:0.01 to about 0.01: 99.99;
   wherein the additive composition is used at a temperature range varying from about 60^0C to about 180^0C.

2. The additive composition as claimed in **Claim 1**, wherein the tertiary butyl catechol (TBC) comprises 4-tert-butyl catechol; 3,5-di-tert-butyl catechol; or a mixture thereof.

3. A method for controlling and inhibiting polymerization of pyrolysis gasoline, wherein the method comprises a step of treating the pyrolysis gasoline with the additive composition as claimed in **claim 1 or 2**.

4. A method of using the additive composition as claimed in **claim 1 or 2** for controlling and inhibiting polymerization of pyrolysis gasoline, wherein the method comprises a step of treating the additive composition as claimed in **claim 1 or 2** with the pyrolysis gasoline.

5. A method for operating a primary fractionator by controlling and inhibiting polymerization of pyrolysis gasoline in the primary fractionator, wherein the method comprises treating the additive composition as claimed in **claim 1 or 2** with the pyrolysis gasoline in the primary fractionator.

6. A method for reducing fouling and polymer deposits in a primary fractionator by controlling and inhibiting polymerization of pyrolysis gasoline in the primary fractionator, wherein the method comprises a step of treating the pyrolysis gasoline with the additive composition as claimed in **claim 1 or 2**.

7. A method to extend a run-length of a primary fractionator or of an ethylene plant by reducing fouling and polymer deposits in the primary fractionator by controlling and inhibiting polymerization of pyrolysis gasoline in the primary fractionator or an ethylene plant, wherein the method comprises a step of treating the pyrolysis gasoline with the additive composition as claimed in **claim 1 or 2**.