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(54) Titre : SYSTEME ET PROCEDE DE CONVERSION DE DECHETS PLASTIQUES EN PRODUITS PETROLIERS
(54) Title: SYSTEM AND PROCESS FOR CONVERTING PLASTIC WASTE TO OIL PRODUCTS

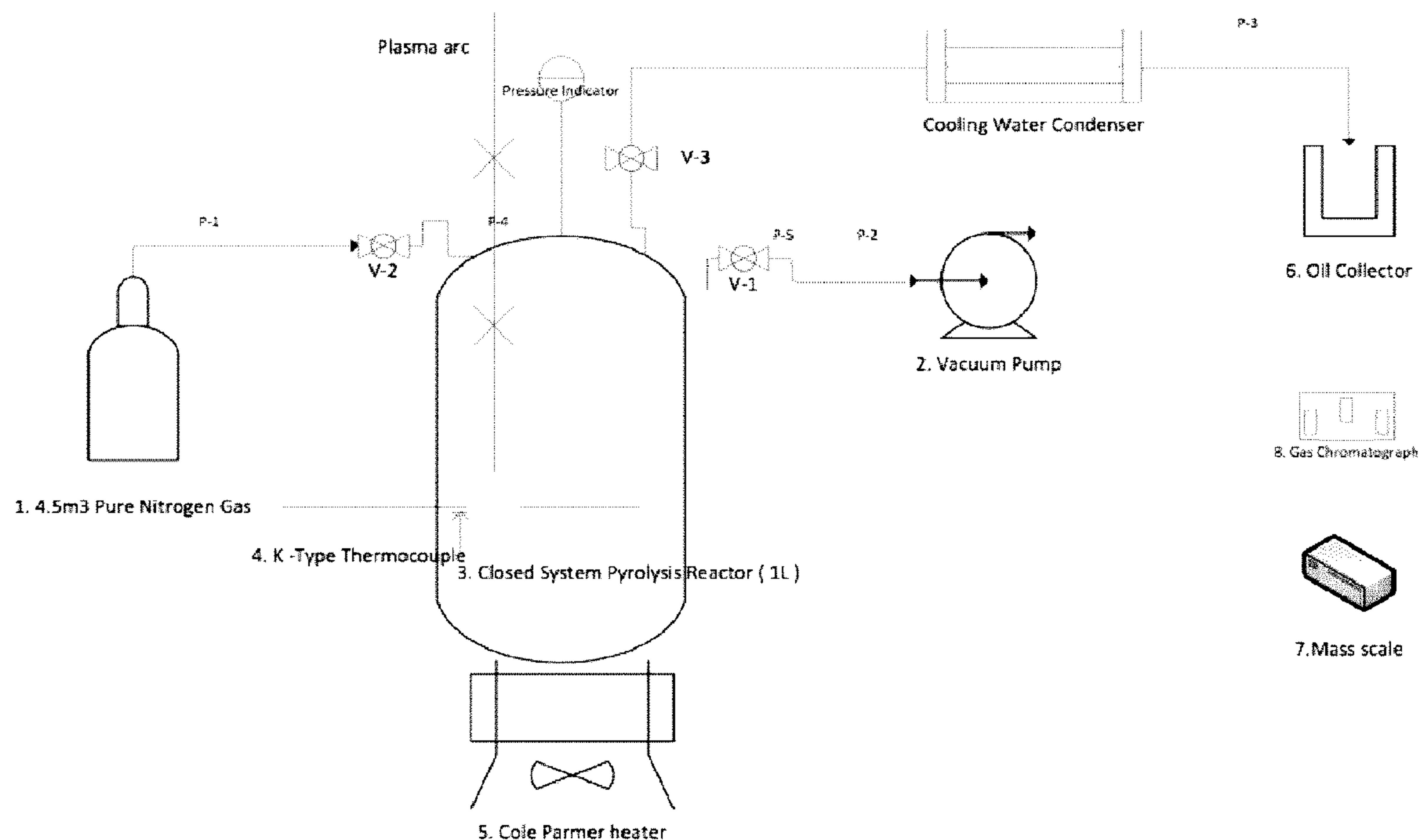


FIG. 6-1

(57) **Abrégé/Abstract:**

In one aspect, a process is provided for converting thermoplastic waste into hydrocarbon gaseous and liquid products. The process includes: placing in a reactor an amount of thermoplastic to be converted; depressurizing the reactor to remove air; filling

(57) **Abrégé(suite)/Abstract(continued):**

the reactor with an inert gas; subjecting the amount of thermoplastic to a thermal plasma arc source operating at a select temperature profile for a preselected residence time to produce a gaseous product; directing the gaseous product through at least one condenser; and collecting a liquid fraction condensed from the gaseous product in the at least one condenser.

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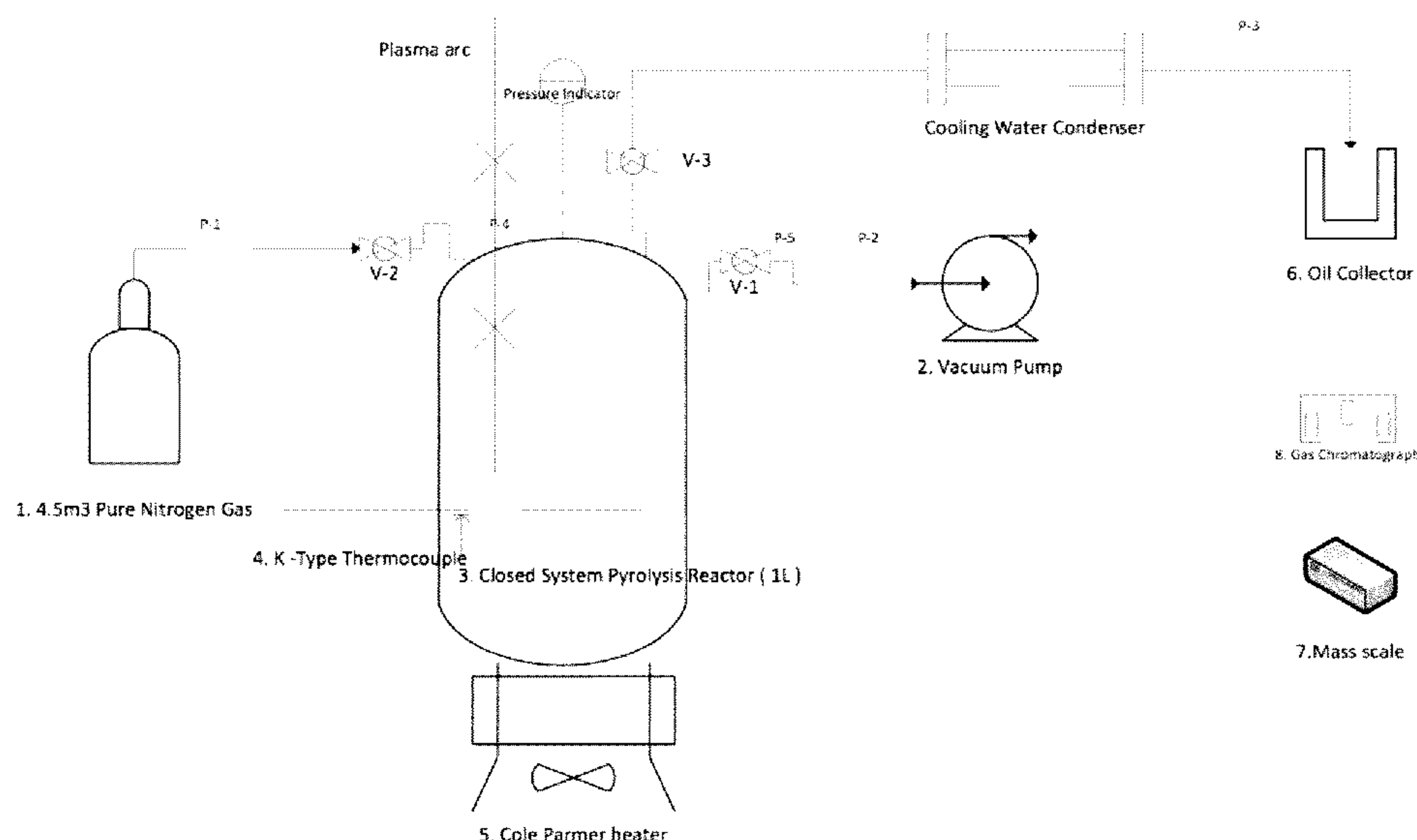


FIG. 6-1

(57) Abstract: In one aspect, a process is provided for converting thermoplastic waste into hydrocarbon gaseous and liquid products. The process includes: placing in a reactor an amount of thermoplastic to be converted; depressurizing the reactor to remove air; filling the reactor with an inert gas; subjecting the amount of thermoplastic to a thermal plasma arc source operating at a select temperature profile for a preselected residence time to produce a gaseous product; directing the gaseous product through at least one condenser; and collecting a liquid fraction condensed from the gaseous product in the at least one condenser.

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WHAT IS CLAIMED IS:

1. A process for converting thermoplastic waste into hydrocarbon gaseous and liquid products, the process comprising:
 - placing in a reactor an amount of thermoplastic to be converted;
 - depressurizing the reactor to remove air;
 - filling the reactor with an inert gas;
 - subjecting the amount of thermoplastic to a thermal plasma arc source operating at a select temperature profile for a preselected residence time to produce a gaseous product;
 - directing the gaseous product through at least one condenser; and
 - collecting a liquid fraction condensed from the gaseous product in the at least one condenser.
2. The process according to claim 1, wherein the inert gas is a pressurized nitrogen gas.
3. The process according to claim 2, wherein the pressurized nitrogen gas is added to the reactor to a pressure of 1 bar.
4. The process according to claim 1, wherein the thermal plasma arc source is a direct current thermal plasma arc source.
5. The process according to claim 1, wherein the preselected residence time is from about 20 to about 40 minutes.
6. The process according to claim 1, wherein the preselected residence time is from about 25 to about 35 minutes.

7. The process according to claim 1, wherein the preselected residence time is about 30 minutes.
8. The process according to claim 1, wherein the thermoplastic is selected from the group consisting of low density polyethylene(LDPE), high density polyethylene (HDPE), polystyrene (PS), polypropylene (PP) and polyethylene tetrphalate (PETE).
9. The process according to claim 1, wherein the reactor is a closed system reactor.
10. A process for converting thermoplastic waste into hydrocarbon gaseous and liquid products, the process comprising:
 - receiving a feedstock of thermoplastic to be converted;
 - granulating the feedstock to reduce the thermoplastic to a preselected granule size;
 - delivering the granulated feedstock to a preheat unit and preheating the granulated feedstock based on a preselected preheat temperature profile;
 - delivering the preheated granulated feedstock into a reactor and subjecting the feedstock to pyrolysis based on a preselected pyrolysis temperature profile for a preselected residence time to produce a gaseous product;
 - directing the gaseous product through at least one condenser; and
 - collecting a liquid fraction condensed from the gaseous product in the at least one condenser.