condensable gas is also utilized to liberate the volatile organic material from the SIR. Once the SIR have been generally been substantially liberated of volatile organic material, the residues are transferred to a collection area that compresses (compacts) the residues into a mass of material. The collection area is locked, i.e., is gas-tight so that any air or remaining volatile organic material cannot escape to the atmosphere but the SIR can be compressed and discharged from the collection area and subsequently disposed. In the conveyance embodiment, a sweep gas generally is not utilized in the dryer to remove various gases therefrom since previously, it has been purged of oxygen.

[0004] According to a first aspect of the present invention, there is provided a solid inert residue (SIR) dryer, including: the dryer having one or more heating units and one or more drying substrates, the dryer capable of heating and drying a SIR on the substrate and removing an amount of volatile organic material therefrom; the substrate capable of transferring the dried SIR to a collection area; the collection area comprising a compaction system for compacting the dried SIR; wherein a first valve is present at an entrance to the collection area which is selectively switchable to form a seal that isolates the collection area from the volatile organic material in the dryer; and wherein the compaction system comprises at least one cylinder having a piston. In the conveyance embodiment, multiple plungers, or isolating valves and augers, are utilized to efficiently compact and collect the SIR.

[0005] According to a second aspect of the present invention, there is provided a solid inert residue (SIR) dryer, including: the dryer having one or more heating units and one or more drying substrates, the dryer capable of heating and drying a SIR on the substrate and removing an amount of volatile organic material therefrom; the substrate capable of transferring the dried SIR to a collection area; the collection area comprising a container having an inert gas therein; and wherein a first valve is present at an entrance to the collection area which is selectively switchable to form a seal that isolates the container in the collection area from the volatile organic material in the dryer.

[0006] According to a third aspect of the present invention, there is provided a process for removing a volatile organic material from the above SIR, including the steps of: adding the SIR to the dryer; heating the dryer and removing the volatile organic material from the SIR; transferring the dried SIR material to the collection area; and collecting the dried SIR.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] The foregoing and other features of the present invention will become apparent to those skilled in the art to which the present disclosure relates upon reading the following description with reference to the accompanying drawings, in which:

[0008] FIG. 1 is a schematic view of a plastic conversion vessel of the present invention wherein various reactions can occur;

[0009] FIG. 2 is a schematic view of a SIR dryer of the present invention, and