CLAIMS

What is claimed is:

1. A process for the depolymerization of polyethylene terephthalate (PET) comprised in a feedstock to form dimethyl terephthalate (DMT) and mono ethylene glycol (MEG); the process comprising:
(i) mixing the feedstock comprising polyethylene terephthalate (PET) with a first portion of methanol to form a first mixture;
(ii) adding sodium methoxide to the first mixture;
(iii) admixing; and
(iv) adding a second portion of methanol thereby forming a second mixture;
thereby forming dimethyl terephthalate (DMT) and mono ethylene glycol (MEG).
2. The process of claim 1, wherein the amount of the first portion of methanol is from 0.1 to 0.5 kg/kg of feedstock.
3. The process of claim 1 or 2, wherein step (i) is conducted for 15 mins to 120 mins.
4. The process of any one of claims 1-3, wherein step (i) is conducted at a temperature from 50°C to 100°C.
5. The process of any one of claims 1-4, wherein step (iii) is conducted for 10 min to 120 min.
6. The process of any one of claims 1-5, wherein step (iii) is conducted at a temperature from 40°C to 100°C.
7. The process of any one of claims 1-6, wherein the second portion of methanol is provided to maintain the sodium methoxide concentration in the second mixture from 0.2 wt-% to 5.0 wt-%.
8. The process of any one of claims 1-7, wherein the second portion of methanol is provided in fractions at predetermined times.
9. The process of claim 8, wherein a first fraction of the second portion of methanol is provided 1 min to 60 min after the addition of sodium methoxide.
10. The process of claim 9, wherein the amount of the first fraction of the second portion of methanol is from 50 g/kg of feedstock to 100 g/kg of feedstock.
11. The process of any one of claims 8-10, wherein a second fraction of the second portion of methanol is provided 30 min to 90 min after the addition of sodium methoxide.
12. The process of claim 11, wherein the amount of the second fraction of the second portion of methanol is from 100 g/kg of feedstock to 200 g/kg of feedstock.
13. The process of any one of claims 8-12, wherein a third fraction of the second portion of methanol is provided 60 min to 120 min after the addition of sodium methoxide.
14. The process of claim 13, wherein the amount of the third fraction of the second portion of methanol is from 100 g/kg of feedstock to 200 g/kg of feedstock.
15. The process of any one of claims 1-14, wherein the second portion of methanol is provided continuously.
16. The process of claim 15, wherein the second portion of methanol is provided continuously at a rate from 50 g/h/kg of feedstock to 100 g/h/kg of feedstock.

17. The process of any one of claims 1-16, wherein the ratio of sodium methoxide to polyethylene terephthalate (PET) is from 1:2 to 1:28 (mol/mol).
18. The process of any one of claims 1-17, wherein the dimethyl terephthalate is obtained in at least 90 mol% yield.
19. The process of any one of claims 1-18, wherein the feedstock comprising polyethylene terephthalate (PET) is provided in the form of particles.
20. The process of claim 19, wherein the average particle size is from 0.1 mm to 20 mm.