C L A I M S

1. Process for steam cracking a hydrocarbon feed, comprising the steps of:

recovering aliphatic hydrocarbons from a liquid hydrocarbon feedstock stream in a process for the recovery of aliphatic hydrocarbons from a liquid hydrocarbon feedstock stream, which comprises a liquid product produced by the pyrolysis of plastic waste and which comprises aliphatic hydrocarbons, polar components and optionally aromatic hydrocarbons, wherein the aliphatic hydrocarbons comprise paraffinic and olefinic aliphatic hydrocarbons, wherein the polar components comprise heteroatom containing organic compounds and optionally salts, wherein the heteroatom containing organic compounds contain one or more heteroatoms which are oxygen, nitrogen and/or a halogen, and wherein the amount of the polar components is at least 0.5 wt.% and the amount of the optional aromatic hydrocarbons is at most 20 wt.%, said process comprising the steps of:

feeding the liquid hydrocarbon feedstock stream to a first column;

feeding a first solvent stream which comprises an organic solvent to the first column at a position which is higher than the position at which the liquid hydrocarbon feedstock stream is fed, wherein the organic solvent in the first solvent stream contains one or more heteroatoms;

contacting at least a portion of the liquid hydrocarbon feedstock stream with at least a portion of the first solvent stream; and

recovering at least a portion of the aliphatic hydrocarbons by liquid-liquid extraction of polar components and optionally aromatic hydrocarbons with organic solvent,

resulting in a stream comprising recovered aliphatic hydrocarbons and optionally organic solvent and a bottom stream from the first column comprising organic solvent, polar components and optionally aromatic hydrocarbons; and

steam cracking a hydrocarbon feed, wherein the hydrocarbon feed comprises aliphatic hydrocarbons recovered in the preceding step.

2. Process according to claim 1, wherein the weight ratio of aliphatic hydrocarbons having a boiling point of from 30 to 300 °C to aliphatic hydrocarbons having a boiling point of from greater than 300 to 600 °C in the liquid hydrocarbon feedstock stream is of from 99:1 to 1:99.

3. Process according to claim 1 or 2, wherein the stream comprising recovered aliphatic hydrocarbons and optionally organic solvent comprises recovered aliphatic hydrocarbons and organic solvent, and wherein organic solvent is separated from the stream comprising recovered aliphatic hydrocarbons and organic solvent and is recycled to the first column.

4. Process according to claim 3, additionally comprising the steps of:

providing a second solvent stream which comprises water;

contacting at least a portion of the stream comprising recovered aliphatic hydrocarbons and organic solvent with at least a portion of the second solvent stream; and

removing at least a portion of the organic solvent from the stream comprising recovered aliphatic hydrocarbons and organic solvent by liquid-liquid extraction of organic solvent with water.

5. Process according to claim 4, wherein the first and second solvent streams are fed to the first column and the second solvent stream is fed to the first column at a position which is higher than the position at which the first solvent stream is fed, resulting in a top stream from the first column comprising recovered aliphatic hydrocarbons.

6. Process according to claim 4, wherein the stream comprising recovered aliphatic hydrocarbons and organic solvent is a top stream from the first column which is fed to a second column, the second solvent stream is fed to the second column at a position which is higher than the position at which the top stream from the first column comprising recovered aliphatic hydrocarbons and organic solvent is fed, resulting in a top stream from the second column comprising recovered aliphatic hydrocarbons and a bottom stream from the second column comprising water and organic solvent.

7. Process according to any one of the preceding claims, wherein the organic solvent in the first solvent stream is selected from the group consisting of diols and triols, including monoethylene glycol, monopropylene glycol and any isomer of butanediol; glycol ethers, including oligoethylene glycols, including diethylene glycol and tetraethylene glycol, and ethers thereof, including diethylene glycol dimethylether; amides, including N-alkylpyrrolidone, wherein the alkyl group may contain 1 to 8 or 1 to 3 carbon atoms, including N-methylpyrrolidone, and dialkyl formamide, wherein the alkyl group may contain 1 to 8 or 1 to 3 carbon atoms, including dimethyl formamide; dialkylsulfoxide, wherein the alkyl group may contain 1 to 8 or 1 to 3 carbon atoms, including dimethylsulfoxide; sulfolane; N-formyl morpholine;

and furan ring containing components, including furfural, 2-methyl-furan and furfuryl alcohol.

8. Process according to any one of claims 1-6, wherein the organic solvent in the first solvent stream has an $R_{a,heptane}$ of at least 10 $MPa^{1/2}$ or at least 15 $MPa^{1/2}$ and a difference in $R_{a,heptane}$ compared to $R_{a,toluene}$ of at most 4.5 $MPa^{1/2}$ or at most 4 $MPa^{1/2}$, wherein $R_{a,heptane}$ and $R_{a,toluene}$ refer to the Hansen solubility parameter distance with respect to heptane and toluene, respectively, as determined at 25 °C.