3. Method for producing erythropoietin comprising culturing cells containing an EPO-encoding nucleic acid and isolating erythropoietin from the cells or the culture medium, characterized in that the isolation of erythropoietin comprises the following steps:

   i) applying the cell supernatant to an affinity chromatography material and recovering/collecting the fractions containing erythropoietin,
   ii) optionally applying the fractions containing erythropoietin from i) to a hydrophobic interaction chromatography material and recovering/collecting the fractions containing erythropoietin,
   iii) applying the fractions containing erythropoietin from i) or ii) to a stationary phase containing ceramic hydroxyapatite and recovering/collecting the fractions containing erythropoietin using a method according to one of claims 1 to 2.

4. Method for producing mono-PEGylated erythropoietin comprising the following steps:

i) purifying erythropoietin with a method according to one of claims 1 to 2,
ii) PEGylating erythropoietin using an activated PEG having a molecular weight between 20 kDa and 40 kDa,
iii) purifying the PEGylated erythropoietin obtained in step ii) with two successive cation exchange chromatography steps using the same stationary phase,
iv) recovering and thereby producing mono PEGylated erythropoietin from the second stationary phase.

~~5. Pharmaceutical composition containing an erythropoietin which has been obtained by a method according to one of the claims 1 to 2 optionally together with a pharmaceutical diluent, auxiliary agent and/or carrier agent.~~