CLAIMS

1. A pharmaceutical composition characterized in that it comprises as active ingredient a recombinant human erythropoietin (rhEPO) whose isoelectric point profile is between 4.25 and 5.85 and characterized in that the microheterogeneity of fucosylated N-glycans is formed by bi, tri and tetra-antennary structures, which have mono and bi-sialylated sialic acid residues in a range of 40-60% of the total of glycans, tri-sialylated ones in a range from 40-43% of the total glycans and tetra-sialylated ones in a range from 10-13% of the total glycans and a pharmaceutically acceptable excipient.
2. The pharmaceutical composition of claim 1 characterized in that the O-glycosylation site in serine 126 has 3 sialoforms that have between 0 and 2 sialic acid residues, where the monosialylated structure is the most abundant and represents between 78-82% of the total glycans and asialylated structures represent between 6-10% of the total glycans.
3. The pharmaceutical composition of claim 1 characterized in that the N-glycosylation site of asparagine 83 comprises:

   - Fucosylated biantennary structures with 1 and 2 sialic acid residues, where said structures represent 8-12% of the total glycans,
   - Fcosylated triantennary structures with 1, 2 and 3 sialic acid residues, where said structures represent 17-21% of the total glycans,
   - Fucosylated tetraantennary structures with between 1 and 4 sialic acid residues, where said structures represent 27-31% of the total glycans and
   - Fucosylated tetraantennary structures with N-acetyl lactosamine type 1 and 2 that present between 1 to 4 sialic acid residues, where said structures represent 38-42% of the total glycans.

4. The pharmaceutical composition of claim 1 characterized in that the pharmaceutically acceptable excipient comprises bioadhesive polymers and protein stabilizers.

5. The pharmaceutical composition of claim 4 characterized in that the bioadhesive polymers are selected from the group comprising:

   - hydroxymethylcellulose,
   - hydroxypropylcellulose and
   - methylcellulose.

6. The pharmaceutical composition of claim 4 characterized in that the protein stabilizers are selected from the group comprising:

   - L-tryptophan,
   - L-leucine,
   - L-arginine hydrochloride and
   - L-histidine hydrochloride.

7. A method for obtaining an hyposialylated rhEPO without additional chemical and genetic modifications and an isoelectric point profile between 4.25 and 5.85, characterized in that the fermentation process takes place in stirred tank and in that in the purification process a chromatographic step with monolithic column as an anion exchanger with a Q quaternary ammonium ligand is used.

8. The method of claim 7 characterized in that the fermentation process of rhEPO is performed in stirred tank at a temperature of 35°C and pH range between 7.2-7.3, in a protein-free culture medium supplemented with glutamine to give a final concentration of between 8 and 12 mmol/L.

9. The method of claim 7 characterized in that in the purification process a 20 mmol/L Tris 10 mmol/L HCl solution with pH 8 and conductivity 1.5 mS/cm is used and as equilibrium buffer and a 50 mmol/L sodium acetate solution with pH 4.41 as elution buffer.

10. The pharmaceutical composition whose active ingredient is the hyposialylated rhEPO obtained with the method of claims 7-9.

11. The pharmaceutical composition of claims 1-6 and 10 for the manufacture of a medicament for the treatment of dementia, stroke, Parkinson's disease, ataxia, craniocerebral trauma, glaucoma, autism, hypoxia of the newborn, multiple sclerosis, amyotrophic lateral sclerosis and neurological damage induced by trauma, intoxication or radiation.

12. The use of the pharmaceutical composition of claims 1-6 and 10 in the manufacture of a medicament to be administered in a range from 0.1 mg to 4 mg in a volume of 1 mL one to three times per week for 6 to 12 months.