CLAIMS

1. An acid-base polymer blend membrane comprising at least one first polymer exhibiting acidic groups (A) and at least one second polymer exhibiting basic groups (B), wherein the molar ratio of acidic groups A / basic groups B in the acid-base polymer blend membrane is in a range of from 1 / 0.25 to 1 / 0.07, wherein the basic group of the second polymer is selected from the group consisting of pyridine, triazole, benzotriazole, pyrazol, benzpyrazol, imidazole, and benzimidazole, and wherein the at least one first polymer is selected from the group consisting of sulfonated polyphenylsulfone (sPPSU) having a degree of sulfonation of 42%, sulfonated poly(ether ether ketone) (sPEEK) having a degree of sulfonation of at least 50%, and sulfonated poly (ether ketone) (sPEK) having a degree of sulfonation of at least 30%.

2. The acid-base polymer blend membrane according to claim 1, wherein the basic group is imidazole or benzimidazole.

3. The acid-base polymer blend membrane according to claims any one of claims 1 to 2, wherein the at least one second polymer is selected from the group consisting of meta-polybenzimidazole (m-PBI), and polybenzimidazole-OO (PBI-OO).

4. The acid-base polymer blend membrane according to any one of claims 1 to 3, wherein the molar ratio of acidic groups A / basic groups B in the acid-base polymer blend membrane is at least 1 / 0.24, or at least 1 / 0.23, or at least 1 / 0.22, or at least 1 / 0.21, or at least 1 / 0.20, or at least 1 / 0,19, or at least 1 / 0.18, or at least 1 / 0.17, or at least 1 / 0.16, or at least 1 / 0.15, or at least 1 / 0.14, or at least 1 / 0.13, or at least 1 / 0.12, or at least 1 / 0.11, or at least 1 / 0.10, or at least 1 / 0.09.

5. The acid-base polymer blend membrane according to any one of claims 1 to 4, wherein the molar ratio of acidic groups A / basic groups B in the acid-base polymer blend membrane is 1 / 0.08 or less, or 1 / 0.09 or less, or 1 / 0.10 or less, or 1 / 0.11 or less, or 1 / 0.12 or less, or 1 / 0.13 or less, or 1 / 0.14 or less, or 1 / 0.15 or less, or 1 / 0.16 or less, or 1 / 0.17 or less, or 1 / 0.18 or less, or 1 / 0.19 or less, or 1 / 0.20 or less, or 1 / 0.21 or less, or 1 / 0.22 or less, or 1 / 0.23 or less.

6. The acid-base polymer blend membrane according to any one of claims 1 to 5, wherein the molar ratio of acidic groups A / basic groups B in the membrane is in the range of from 1 / 0.20 to 1 / 0.08, or from 1 / 0.20 to 1 / 0.13, or from 1 / 0.20 to 1 / 0.19, or from 1 / 0.14 to 1 / 0.08, or from 1 / 0.14 to 1 / 0.13, or from 1 / 0.09 to 1 / 0.08.

7. Cell membrane comprising a support structure and an acid-base polymer blend membrane according to any one of claims 1 to 6, wherein the acid-base polymer blend membrane is impregnated on the support structure.

8. Cell membrane according to claim 7, wherein the support structure is a woven or nonwoven fabric, or wherein the fabric comprises a polymer selected from the group consisting of polyethylene (PE), polypropylene (PP), polyamide (PA), polysulfone (PSU), polyether ether ketone (PEEK), polyether ketone (PEK), polyvinylidene fluoride (PVDF), polyethersulfone (PES), polyetherimide (PEI), polybenzimidazole (PBI), polyethylene terephthalate (PET), polyester and polyphenylene oxide (PPO); or wherein the fabric comprises glass fibers.

9. Cell membrane according to any one of claims 7 or 8, wherein the support structure has a thickness in the range of from 1 to 250 µm, or from 1 to 200 µm, or from 2 to 200 µm, or from 5 to 100 µm, or from 10 to 200 µm, or from 50 to 100 µm, or from 5 to 50 µm, or from 20 to 50 µm, or from 1 to 60 µm, or from 10 to 50 µm, or from 1 to 25 µm, or from 2 to 20 µm.

10. Cell membrane according to any one of claims 7 to 9, wherein the support structure is impregnated with the acid-base polymer blend membrane on one side of the support structure, or wherein the entire support structure is impregnated with the acid-base polymer blend membrane.

11. Cell membrane according to claim 10, wherein the support structure is impregnated with the acid-base polymer blend membrane, and wherein the impregnated support structure has a thickness in the range of from 1 µm to 400 µm, or from 10 to 100 µm, or from 50 to 100 µm, or from 20 to 50 µm.

12. Use of the acid-base polymer blend membrane according to any one of claims 1 to 6, or of the cell membrane according to any one of claims 7 to 11 in an electrodialysis cell, in a fuel cell, in a PEM electrolyzer, or in a redox flow battery.

13. Device comprising an acid-base polymer blend membrane according to any one of claims 1 to 6, or a cell membrane according to any one of claims 7 to 11, wherein the device is an electrodialysis cell, a fuel cell, a PEM electrolyzer, or a redox flow battery.