

WHAT IS CLAIMED IS:

1. A method for removing impurities from an organic solvent, comprising:
distilling the organic solvent in a distillation column to obtain a distilled organic
5 solvent; and
passing the distilled organic solvent through an ion exchange filter unit to obtain
a purified organic solvent;
wherein the ion exchange filter unit comprises a housing and at least one first ion
exchange filter and at least one second ion exchange filter in the housing, the at least
10 one first ion exchange filter and the at least one second ion exchange filter are both
negatively charged ion exchange filters and are connected in series, and the at least
one first ion exchange filter is different from the at least one second ion exchange filter.
2. The method of claim 1, wherein the organic solvent comprises an alcohol.
- 15 3. The method of claim 1, wherein the organic solvent comprises isopropyl
alcohol.
4. The method of claim 1, wherein the at least one first ion exchange filter
20 comprises a filtration medium that comprises a polyolefin, a polyamide, a fluoropolymer,
or a copolymer thereof.
5. The method of claim 1, wherein the ion exchange filter unit comprises two
to five first ion exchange filters.
- 25 6. The method of claim 5, wherein the first ion exchange filters are
connected in parallel.
7. The method of claim 1, wherein the at least one first ion exchange filter is
30 capable of removing at least 90 wt% of Fe, Ni, Cr, Zn, or Cu from the organic solvent.

8. The method of claim 1, wherein the at least one second ion exchange filter comprises a filtration medium that comprises a polyolefin, a polyamide, a fluoropolymer, or a copolymer thereof.
- 5 9. The method of claim 1, wherein the filtration medium in the at least one first or second ion exchange filter comprises a polyethylene having sulfonate groups, a polytetrafluoroethylene having sulfonate groups, or a copolymer thereof.
- 10 10. The method of claim 1, wherein the ion exchange filter unit comprises two to five second ion exchange filters.
11. The method of claim 10, wherein the second ion exchange filters are connected in parallel.
- 15 12. The method of claim 1, wherein the at least one second ion exchange filter is capable of removing at least 70 wt% of K, Na, or Ca from the organic solvent.
13. The method of claim 1, wherein the at least one second ion exchange filter is disposed downstream of the at least one first ion exchange filter.
- 20 14. The method of claim 1, further comprising passing the organic solvent through a filter unit in fluid communication with and between the distillation column and the ion exchange filter unit.
- 25 15. The method of claim 14, wherein the filter unit between the distillation column and the ion exchange filter unit comprises a housing and at least one particle removal filter in the housing.
- 30 16. The method of claim 15, wherein the at least one particle removal filter comprises a filtration medium that comprises a polyolefin, a polyamide, a fluoropolymer, or a copolymer thereof.

17. The method of claim 16, wherein the at least one particle removal filter comprises a filtration medium that comprises a polytetrafluoroethylene.
- 5 18. The method of claim 15, wherein the at least one particle removal filter comprises a filtration medium having an average pore size of from about 5 nm to about 50 nm.
- 10 19. The method of claim 1, further comprising passing the organic solvent through a filter unit downstream of and in fluid communication with the ion exchange filter unit.
- 15 20. The method of claim 19, wherein the filter unit downstream of the ion exchange filter unit comprises a housing and at least one particle removal filter in the housing.
- 20 21. The method of claim 20, wherein the at least one particle removal filter in the filter unit downstream of the ion exchange filter unit comprises a filtration medium that comprises a polyolefin, a polyamide, a fluoropolymer, or a copolymer thereof.
22. The method of claim 21, wherein the at least one particle removal filter in the filter unit downstream of the ion exchange filter unit comprises a filtration medium that comprises a polytetrafluoroethylene.
- 25 23. The method of claim 20, wherein the at least one particle removal filter in the filter unit downstream of the ion exchange filter unit comprises a filtration medium having an average pore size of from about 2 nm to about 10 nm.
- 30 24. The method of claim 19, further comprising recirculating the organic solvent exiting the filter unit downstream of the ion exchange filter unit.

25. The method of claim 24, wherein the recirculating comprises moving the organic solvent exiting the filter unit downstream of the ion exchange filter unit to a storage tank and subsequently passing the organic solvent through the ion exchange filter unit.

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26. The method of claim 1, further comprising moving the purified solvent to a packaging station.

27. The method of claim 1, wherein the purified organic solvent comprises
10 metal impurities in a total amount of at most about 200 ppt of the purified organic solvent.

28. A system, comprising:
a distillation column; and
15 an ion exchange filter unit downstream of and in fluid communication with the distillation column;

wherein the ion exchange filter unit comprises a housing and at least one first ion exchange filter and at least one second ion exchange filter in the housing, the at least one first ion exchange filter and the at least one second ion exchange filter are both
20 negatively charged ion exchange filters and are connected in series, and the at least first ion exchange filter is different from the at least one second ion exchange filter.