CLAIMS:

1. A process for the selective detection of low molecular weight molecules from a sample comprising the steps of
   a) placing said sample with SBA-15 particles; and
   b) subjecting the same to desorption ionization mass spectrometry,
   wherein low molecular weight molecules are selectively detected over the higher molecular weight molecules.
2. A process as claimed in claim 1, wherein either SBA-15 and/or said sample is chemically or physically modified.
3. A process claimed in claim 2, wherein said SBA-15 and/or said sample is modified with a chemical or physical agent that introduces positive or negative charges to low molecular weight analytes to improve their selective mass spectrometric analysis.
4. A process as claimed in any of preceding claims 1 to 3 wherein a solvent system is present.
5. A process as claimed in claim 4, wherein SBA-15 and solvent are present in a ratio of 5:1 (w/v).
6. A process as claimed in claim 1 or 2, wherein said solvent is an organic solvent methanol, acetonitrile or ethylacetate, preferably methanol.
7. A process claimed in claim 3 wherein the chemical or physical agent is a charge modifier selected from alkali metal salts.
8. A process claimed in claim 7 wherein the alkali metal salt preferably comprises lithium chloride to introduce positive charges.
9. A process as claimed in claims 1 and 8, wherein when sample is present with charge modifiers, the ratio of SBA-15 and charge modifier is from 1:1- 7:1 (w/v)
10. A process as claimed in claim 8 wherein SBA-15 is mixed with lithium chloride in methanol (7:1 v/v) in order to cause selective lithiation over sodiated and potassiated adducts of quorum sensing molecules selected from homoserine lactones, autoinducer peptides, and others from bacterial biofilm cultures in synthetic media or biological fluids, and wherein the lithiated quorum sensing molecules exhibit higher signal to noise ratio enabling MS and MS/MS analysis.

11. A process as claimed in any preceding claim, wherein the molecules detected have molecular weight less than 1000(m/z) where z=1.
12. A process as claimed in any preceding claim, wherein said sample is a fluid of biological or synthetic origin comprising a mixture of small molecular weight analytes and large molecular weight analytes.
13. A process as claimed in any preceding claim, wherein said sample is a solid, semi solid, gel, amorphous mixture, or a surface of biological or synthetic origin comprising a mixture of small molecular weight analytes and large molecular weight analytes.
14. A process as claimed in any preceding claim, for use in clinical diagnostics, forensics, dope and narcotic analysis, environmental analysis, microbial community analysis and quorum sensing, pesticide analysis, food analysis, industrial fermentation, active pharmaceutical ingredient (API) or drug discovery or for high throughput mass spectrometry research use and practice wherein the samples comprise a mixture of small molecular weight analytes and large molecular weight analytes.
15. A process as claimed in any preceding claim wherein the detection involves minimal, optimal or no sample preparation.
16. A process as claimed in any preceding claim, wherein the SBA-15 particles are employed as particles as powder or suspension in reagents or on a surface or as a free standing film or as a part of a device such as a chromatographic or mass spectrometric surface or device.
17. A process of performing selective laser desorption ionization mass spectrometry comprising:
    a) preparing mesoporous SBA-15 particles having a desired pore size by preparing a suspension of SBA-15 particles in a solvent system selected from organic solvents preferably methanol or alternate polar organic solvents selected from acetonitrile or ethylacetate,
    b) optionally subjecting solution of step a to sonication dispersing SBA-15 in a solvent system;
    c) mixing said suspension of SBA-15 with a sample of analytes/molecules;
    d) subjecting the solution of step c to a laser in an ion generating section of a mass spectrometer to desorb and ionize the sample; and

e) detecting the desorbed and ionized sample.

wherein the sample in step c is optionally modified with surface charge modifiers.

18. A process as claim in claim 17, wherein in step b the solvent used is triflouoroacetic acid (TFA) and present in a ratio of 1:1 with SBA-15 (v/v).

19. A process as claimed in claims 1-18, wherein the molecules detected are selected from the group consisting of bacterial quorum sensing molecules, amino acids, synthetic or modified small molecules, lipids, fatty acids and their derivatives, therapeutic, pharmaceutical and drug molecules, metabolites, food, pesticide and environmental samples.

20. A process as claimed in any preceding claim wherein the SBA-15 when placed on a sample surface ablates the surface layer(s) thereof enabling their transition into vapor or gaseous phase followed by selective mass analysis.

21. Use of SBA-15 for the selective detection of low molecular weight analytes from a sample excluding large molecular weight analytes.

22. A use of SBA-15 as claimed in claim 21 for the selective detection of amino acids from a sample excluding peptides / proteins.

23. Use of SBA-15 as claimed in claim 22 wherein the analytes detected have molecular weight of less than 1000 (m/z).

24. Use of SBA-15 as claimed in claim 22 wherein SBA-15 is chemically or physically modified.

25. Use of SBA-15 as claimed in claim 24 wherein said SBA-15 and/or said sample is modified with a chemical or physical agent that introduces positive or negative charges to low molecular weight analytes to improve their selective mass spectrometric analysis.

26. Use of SBA-15 as claimed in claim 24 wherein wherein a solvent system is present.

27. Use of SBA-15 as claimed in claim 26 wherein said solvent is selected from the group consisting of methanol, acetonitrile or ethylacetate, preferably methanol.

28. Use of SBA-15 as claimed in claim 27 wherein said solvent is used with SBA-15 in a ratio of 1:5 (v/w).

29. Use of SBA -15 as claimed in claim 21, wherein the sample is used with the modifiers that modify the charge on the surface of molecules to be detected.

30. Use of SBA-15 as claimed in claim 29, wherein said modifier is selected from an alkali metal salt solution.
31. Use of SBA-15 as claimed in claim 30, wherein said modifier is a lithium salt solution, preferably lithium chloride.
32. Use of SBA-15 as claimed in any preceding claim wherein SBA-15 and modifiers are present in a ratio 5:7.5(w/v)
33. Use of SBA-15 as claimed in claims 21-32 wherein the molecules detected are selected from the group consisting of Bacterial quorum sensing molecules, amino acids, synthetic or modified small molecules, lipids, fatty acids and their derivatives, therapeutic, pharmaceutical and drug molecules, metabolites, food, pesticide and environmental samples.
34. A kit for the detection of small molecules from a complex mixture of analytes comprising:
    a) a first part consisting of SBA-15,
    b) a second part containing chemical reagents,
    wherein said SBA-15 is in the form of a powder or suspension in reagents or on a surface or as a free standing film or as a part of a device such as a chromatographic or mass spectrometric surface or device
35. A kit as claimed in claim 34, wherein the first part consists of SBA-15 powder in methanol in a ratio of 5:1 (w/v).
36. A kit as claimed in claim 34 wherein the kit further comprises a third tube consisting of charge modifiers.
37. A kit as claimed claim 29, wherein said SBA-15 further layered with a charge modifier.
38. A kit as claimed in claims 34-36 wherein said charge modifiers are selected from alkali metal salt solutions.
39. A kit as claimed in claim 38 wherein alkali metal salt solution is lithium chloride.
40. A kit as claimed in claim 34, wherein said kit further comprises a tube consisting of standard compounds.
41. A kit as claimed in claims 34-40, wherein said kit further comprises a surface for spotting the sample.
42. A kit as claimed in claim 41 wherein said surface is a steel multiwell plate.

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43. A kit as claimed in claims 34-42 wherein in said kit SBA-15 is coated on a surface.
44. A kit as claimed in claim 43, wherein SBA-15 may be activated by chemical or physical treatment prior to detection.
45. A kit as claimed in any of preceding claims 34 to 44 wherein the SBA-15 is placed on a sample surface to enable ablation of the surface layers of said sample thereby enabling their transition into vapor or gaseous phase followed by selective mass analysis.
46. A kit as claimed in any of claims 34 to 45 for for monitoring an enzymatic assay by selectively detecting low m/z products formed.
47. A process of selective detection of small molecules from a sample comprising complex sample of molecules using a kit as claimed in claims 34-46 comprising the steps of
    a) preparing a solution of sample to be detected by mixing said sample with the contents of second tube;
    b) mixing said solution of step a) with the contents of second tube in a ratio of 1:1 for a pre determinded time;
    c) spotting the solution of step b on the surface provided and subjecting the same to laser desorption ionization mass spectrometry.
48. A kit for the selective detection of small molecular weight molecules as substantially herein described with the help of examples and drawings.
49. A process for the selective detection of small molecules as substantially herein described with the help of examples and drawings.

CLAIMS:

1. A process for the selective detection of low molecular weight molecules from a sample comprising the steps of

   (a) placing said sample with SBA-15 particles;

   (b) modifying said SBA-15 and/or said sample with a chemical or physical agent that introduces positive charges to low molecular weight analytes to improve their selective mass spectrometric analysis, wherein the chemical or physical agent is a charge modifier selected from lithium salts; and

   (c) subjecting the same to desorption ionization mass spectrometry,

wherein low molecular weight molecules are selectively detected over the higher molecular weight molecules.

2. A process as claimed in any preceding claim wherein a solvent system is present, and said solvent is methanol, acetonitrile or ethylacetate, preferably methanol.

3. A process as claimed in claim 2, wherein SBA-15 and solvent are present in a ratio of 5:1 (w/v).

4. A process claimed in claim 1 wherein the lithium salt comprises lithium chloride to introduce positive charges.

5. A process as claimed in claims 1 and 4, wherein when sample is present with charge modifiers, the ratio of SBA-15 and charge modifier is from 1 :1- 7:1 (w/v).

6. A process as claimed in claim 4 wherein SBA-15 is mixed with lithium chloride in methanol (7:1 w/v) in order to cause selective lithiation over sodiated and potassiated adducts of quorum sensing molecules selected from homoserine lactones, autoinducer peptides, and others from bacterial biofilm cultures in synthetic media or biological fluids, and wherein the lithiated quorum sensing molecules exhibit higher signal to noise ratio enabling MS and MS/MS analysis.

7. A process as claimed in any preceding claim, wherein the molecules detected have molecular weight less than 1000(m/z) where z=1.

8. A process as claimed in any preceding claim, wherein said sample is a fluid of biological or synthetic origin comprising a mixture of small molecular weight analytes and large molecular weight analytes.

9. A process as claimed in any preceding claim, wherein said sample is a solid, semi solid, gel, amorphous mixture, or a surface of biological or synthetic origin comprising a mixture of small molecular weight analytes and large molecular weight analytes.

10. A process as claimed in any preceding claim, wherein the SBA-15 particles are employed as particles or powder or suspension in reagents or on a surface or as a free standing film or as a part of a device such as a chromatographic or mass spectrometric surface or device.

11. A process according to claim 1 of performing selective laser desorption ionization mass spectrometry comprising:

    (a) preparing mesoporous SBA-15 particles having a desired pore size by preparing a suspension of SBA-15 particles in a solvent system selected from organic solvents preferably methanol or alternate polar organic solvents selected from acetonitrile or ethylacetate;

    (b) optionally subjecting solution of step a to sonication dispersing SBA-15 in a solvent system;

    (c) mixing said suspension of SBA-15 with a sample of analytes/molecules;

    (d) subjecting the solution of step c) to a laser in an ion generating section of a mass spectrometer to desorb and ionize the sample; and

    (e) detecting the desorbed and ionized sample.

wherein the sample in step c) is modified with surface charge modifiers selected from lithium salts.

12. A process as claim in claim 11, wherein in step b) the solvent used is trifluoroacetic acid (TFA) and present in a ratio of 1 : 1 with SBA-15 (v/v).

13. A process as claimed in claims 1-12, wherein the molecules detected are selected from the group consisting of bacterial quorum sensing molecules, amino acids, synthetic or modified small molecules, lipids, fatty acids and their derivatives, therapeutic, pharmaceutical and drug molecules, metabolites, food, pesticide and environmental samples.

14. A process as claimed in any preceding claim wherein when the SBA-15 is placed on a sample surface, or when the sample is placed on top of the SBA-15, ablation of the surface layer(s) thereof and the transition of analytes into vapor or gaseous phase is enabled, for selective mass analysis.

15. Use of SBA-15 for the selective detection of low molecular weight analytes from a sample excluding large molecular weight analytes, wherein said SBA-15 and/or said sample is modified with a chemical or physical agent that introduces positive charges to low molecular weight analytes to improve their selective mass spectrometric analysis, wherein the chemical or physical agent is a charge modifier selected from lithium salt solutions.

16. Use of SBA-15 as claimed in claim 15 for the selective detection of amino acids from a sample excluding peptides or proteins.

17. Use of SBA-15 as claimed in claim 16 wherein the analytes detected have molecular weight of less than 1000 (m/z).

18. Use of SBA-15 as claimed in claim 16 wherein a solvent system is present, and wherein said solvent is selected from the group consisting of methanol, acetonitrile or ethylacetate, preferably methanol.

19. Use of SBA-15 as claimed in claim 18 wherein said solvent is used with SBA-15 in a ratio of 1:5 (v/w).

20. Use of SBA-15 as claimed in claim 15, wherein said modifier is lithium chloride.

21. Use of SBA-15 as claimed in claims 15 to 20 wherein SBA-15 and modifiers are present in a ratio 5:7.5(w/v).

22. Use of SBA-15 as claimed in claims 15-21 wherein the molecules detected are selected from the group consisting of bacterial quorum sensing molecules, amino acids, synthetic or modified small molecules, lipids, fatty acids and their derivatives, therapeutic, pharmaceutical and drug molecules, metabolites, food, pesticide and environmental samples.

23. A kit for the detection of small molecules from a complex mixture of analytes comprising:

    (a) a first tube consisting of SBA- 15,

    (b) a second tube containing chemical reagents,

wherein said SBA-15 is in the form of a powder or suspension in reagents or on a surface or as a free standing film or as a part of a device such as a chromatographic or mass spectrometric surface or device,

wherein the kit further comprises a third tube consisting of charge modifiers or said SBA-15 is further layered with a charge modifier, wherein said charge modifiers are selected from lithium salt solutions.

24. A kit as claimed in claim 23, wherein the first tube consists of SBA-15 powder in methanol in a ratio of 5:1 (w/v).

25. A kit as claimed in claim 23 wherein the kit comprises a third tube consisting of charge modifiers.

26. A kit as claimed in claim 23, wherein said SBA-15 is layered with the charge modifier.

27. A kit as claimed in claims 23-25 wherein lithium salt solution is lithium chloride.

28. A kit as claimed in claim 23, wherein said kit further comprises a tube consisting of standard compounds.

29. A kit as claimed in claims 23-28, wherein said kit further comprises a surface for spotting the sample, wherein said surface is a steel multiwell plate.

30. A kit as claimed in claims 23-29 wherein in said kit SBA-15 is coated on a surface.

31. A kit as claimed in claim 30, wherein SBA-15 is activated by chemical or physical treatment prior to detection.

32. A kit as claimed in any of preceding claims 23 to 31 wherein when the SBA-15 is placed on a sample surface, or when the sample is placed on top of the SBA-15, ablation of the surface layers of said sample and thereby the transition of analytes into vapor or gaseous phase is enabled, for selective mass analysis.

33. A kit as claimed in any of claims 23 to 32 for monitoring an enzymatic assay by selectively detecting low m/z products formed.

34. A process of selective detection of small molecules from a sample comprising complex sample of molecules using a kit as claimed in claims 23-33 comprising the steps of

    (a) preparing a solution of sample to be detected by mixing said sample with the content of the kit; and

    (b) spotting the solution on the surface provided and subjecting the same to laser desorption ionization mass spectrometry.