

## List of technologies considered in the Dutch Roadmap Initiative (AGPI)

Date: 6/1/2007

### Structured devices

#### Reactive

1. Catalytic foam reactors
2. Micro-channel reactors (microreactors)
3. Milli-channel reactors
4. Millisecond reactors
5. Monolith reactors
6. Static mixers-reactors
7. Membrane reactors (catalytic)

#### Non-reactive

8. Advanced heat exchangers (hex)
9. Microchannel heat exchangers
10. Structured internals for mass transfer operations
11. Static mixers

### Hybrid

#### Non-reactive

12. Adsorptive distillation
13. Extractive crystallization
14. Extractive distillation
15. Heat-integrated distillation
16. Membrane absorption/stripping
17. Membrane adsorption
18. Membrane crystallization
19. Membrane distillation
20. Membrane extraction ()
21. Static mixers-heat exchangers

#### Reactive

22. Heat exchanger (HEX) reactors
23. Membrane reactors (RSP)
24. Reactive absorption
25. Reactive adsorption
26. Reactive comminution
27. Reactive crystallization
28. Reactive distillation
29. Reactive extraction
30. Reactive extrusion

## **Energy transfer**

### Rotating

31. Centrifugal adsorption technology
32. Centrifugal extractors
33. Rotating Packed Beds
34. Rotor-stator mixers
35. Spinning Disc Reactors (SDRs)
36. Viscous heating
37. Rotating foam reactor

### Impulse

38. Ejector (Venturi) -based reactors
39. Hydrodynamic cavitation reactors
40. Impinging streams reactor
41. Pulsed compression reactor
42. Sonochemical reactors
43. Ultrasound-enhanced crystallization
44. Ultrasound-enhanced phase dispersion / mass transfer
45. Supersonic Gas-Liquid Reactors

### Electromagnetic

46. Electric field-enhanced extraction
47. Electrochemical reactors
48. Microwave drying
49. Microwave extraction
50. Microwave reactors
51. Photochemical reactors
52. Plasma reactors

## **Dynamic**

53. Continuous Oscillatory Baffled Reactors
54. Reverse flow reactors
55. Chemical looping
56. Non-steady operation of gas/liquid beds
57. Pulsed chromatographic reactor
58. Pulse combustion drying

## **Other**

### Supercritical

59. Supercritical reactors
60. Supercritical separations