Institution	Contact	Research Area	Material Synthesized	Microwave Used	Reaction Vessel	Optimal Conditions	Cited MWI Benefits	Publication
Shanghai Institute of Ceramics	Ying-Jie Zhu	nanostructure synthesis	Au Nanorods and Nanowires	Discover	100 mL Round-Bottomed Flask	160°C, 40 min	no seed or template needed	Chemistry Letters Vol. 32, No. 12 (2003)
Shanghai Institute of Ceramics	Ying-Jie Zhu	nanostructure synthesis	Tellurium, various morphologies	Discover		140°C, 30 min	rapid volumetric heating, energy saving	Chemistry Letters Vol. 32, No. 8 (2003)
Shanghai Institute of Ceramics	Ying-Jie Zhu	nanostructure synthesis	Cobalt Oxalate Nanorods	Discover		90°C, 10 min	higher rxn rates and reduction in rxn time	Mat. Res. Bull. 40 (2005) 1929 - 35
Università della Calabria	Mauro Ghedini	synthesis of cycloplatinated complexes	chloridoplatinum complexes	Discover	50 mL glass	110°C, 1 - 6 min	reduced rxn time, improved yield	Eur. J. Inorg. Chem. 2007, 5105 - 11
Florida State University	Geoffrey F. Strouse	nanostructure synthesis	CdSe and CdTe nanocrystals	Discover	static: 10 mL, dynamic: 80 mL	static: 5 - 30 sec, dynamic: 40 min	convenience of a noninjection reaction	J. Am. Chem. Soc. 2008, 130, 8916-8922
Chinese Academy of Sciences	Ying-Jie Zhu	nanostructure synthesis	linked zinc oxide nanorods	Discover	round-bottomed flask	2 minutes at 90°C	higher reaction rates and selectivity	Materials Chem. and Phys. 88 (2004) 421–426
Chinese Academy of Sciences	Ying-Jie Zhu	nanostructure synthesis	selenium nanorods and nanowires	Discover	100 mL round-bottomed flask	30 minutes of heating @ 195°C	rapid volumetric heating, energy saving	Materials Letters 58 (2004) 1234– 1236
Chinese Academy of Sciences	Ying-Jie Zhu	nanostructure synthesis	silver nanowires	Discover		10 minutes of heating @ 110°C	rapid volumetric heating, energy saving	Materials Letters 58 (2004) 1517– 1519
Florida State University	Geoffrey F. Strouse	nanoparticle synthesis	InGaP, InP, CdSe Nanoparticles	Discover (modified)	Sealed	7 min, 280°C	scalable w/out thermal gradient effects	J. Am. Chem. Soc. **2005**, *127* , 15791 - 15800
National University of Singapore	Jim Yang Lee	nanocomposite synthesis	SnO_2/Graphite Nanocomposite	Discover/Commercial	100 mL Glass	85°C, 3 min, stirring / 60 sec (Co)	smaller particles, more homogeneous distr.	Journal of Power Sources 144 (2005) 220-25
University of Arkansas	Bill Durham	synthesis of ruthenium complexes	ruthenium bipyridine	Explorer	sealed	225°C, 5 min	greatly enhanced efficiency	*Inorg. Chem.* **2006**, *45* , 3843 - 45
Penn State University	Sridhar Komarneni	nanoparticle synthesis	Rutile TiO_2 Nanoparticles	MARS 5	Teflon Liner, Ultem Polyetherimide Shell	160°C, 120 min	improved kinetics of crystallization	Mat. Res. Bull. 40 (2005) 2014 - 20
Saga Ceramics Research Laboratory	Hiroaki Katsuki	composite zeolite synthesis	ZSM-5/Porous C Composite	MARS 5	100 mL Teflon	150°C, 4 hr	incr. rate of formation, small particles	Micro & Mesoporous Mats. 86 (2005) 145 - 51
Penn State University	Sridhar Komarneni	nanoparticle synthesis	Anatase TiO_2 Nanoparticles	MARS 5	Double-Walled Teflon Container	160 - 180°C	very efficient, rapid kinetics of crystallization	J. Am. Ceram. Soc. **88** [11] 3238 - 40 (2005)
Kent State University	Mietek Jaroniec	mesoporous silica synthesis	SBA-15 Mesoporous Silica	MARS 5	XP-1500 high-pressure Teflon	160 - 180°C, 3 - 6 hr	temperature and time programming	J. AM. CHEM. SOC. 2006, 128, 14408-14414
Chung-Yuan Christian University	Hong-Wen Wang	mesoporous oxide synthesis	mesoporous TiO_2 photocatalysts	MARS 5	sealed omni vessel	150°C, 1 hr	facile, rapid, superior photocatalytic activity	J. Am. Ceram. Soc. **89** [11] 3388 - 92 (2006)
Penn State University	Sridhar Komarneni	nanophase hematite synthesis	monodispersed α-Fe_2O_3 powder	MARS 5	Teflon-lined	160°C, 10 min	increased kinetics and product purity	J. Am. Ceram. Soc. **84** [10] 2313 - 17 (2001)
Penn State University	Sridhar Komarneni	metal nanoparticle synthesis	Ni nanoparticles of controlled size	MARS 5	Teflon-lined	195°C, 45 min	faster & more cost-effective than alternative	J. Am. Ceram. Soc. **89** [5] 1510 - 17 (2006)
Korea Research Institute of Chemical Technology	Sang-Eon Park/Jong-San Chang	MFI zeolite fabrication	fibrous MFI zeolites	MARS 5	100 mL sealed Teflon autoclave	438 K, 60 min	control of macroscopic morphology	Angew. Chem. Int. Ed. 2005, 44, 556 - 60
Korea Research Inst. of Chem. Tech.	Jong-San Chang	hybrid porous material synthesis	cubic and tetragonal Ni glutarate	MARS 5	100 mL sealed Teflon autoclave	180°C, 2 hr	accelerated crystal., more stable product	*Chem. Eur. J.* **2006**, *22* , 7899 - 905
Korea Research Inst. of Chem. Tech.	Jong-San Chang	nanoporous material synthesis	two nanoporous Ni phosphates	MARS 5	100 mL sealed Teflon autoclave	2 hr for VSB-1, 1 hr for VSB-5	increased phase purity and selectivity	*Chem. Mater.* **2005**, *17* , 4455 - 60
UC Santa Barbara	Anthony K. Cheetham	nanoporous material synthesis	VSB-5, nanoporous Ni phosphate	MARS 5	100 mL sealed Teflon autoclave	180°C, 4 hr	facile morphology control, rapid crystal.	*Chem. Mater.* **2004**, *16* , 1394 - 96
Universidade Estadual Paulista	Amauri J. Paula	mw.-assisted niobate synthesis	antiferroelectric sodium niobate	MARS 5	XP-1500 high-pressure Teflon	100 min for final structure	quick & homog. ceramic powder crystal.	Eur. J. Inorg. Chem. 2008, 1300 - 08
Korea Research Inst. of Chem. Tech.	Sang-Eon Park	zeolite synthesis	Ti-incorporated MFI zeolite	MARS 5	Teflon Autoclave	80°C for 30 min, 165°C for 1 hr	higher yields and cleaner synthetic method	Catalysis Today 111 (2006) 366–372
National Chemical Laboratory	H. S. Potdar	barium titanate nanopowder synthesis	$Ba_{0.75}Sr_{0.25}TiO_3$ nanopowders	MARS 5		200°C, 30 min	faster kinetics, better reproducibility	Materials Letters 59 (2005) 293– 296
Korea Research Institute of Chemical Technology	Jong-San Chang	zeolite synthesis	AFI type molecular sieves	MARS 5	100 mL sealed Teflon autoclave	2 min ramp, .5-2 hr synth (180-200°C)	fast crystallization & increased phase purity	J . Ma t e r . C h em. , 2 0 0 4 , 1 4 , 2 8 0 – 2 8 5
Penn State University	Sridhar Komarneni	molecular sieve synthesis	Ti-substituted mesoporous SBA-15	MARS 5	double-walled: Teflon & polyetherimide	2 hours of heating	volumetric heating, fast supersaturation	Chem. Mater. 2001, 13, 552-557

National Chemical Laboratory	S. K. Date	nanopowder synthesis	$Ce_{0.75}Zr_{0.25}O_2$ mixed metal oxide	MARS 5	XP-1500 Plus (double-walled Teflon)	200°C, 200 psi, 30 minutes of heating	faster kinetics of crystallization, energy saver	Materials Chem. and Phys. 74 (2002) 306–312
Penn State University	Sridhar Komarneni	synthesis from zeolites	Al-substituted tobermorites	MARS 5	double-walled digestion vessel	180°C, 2 hours of heating	increased kintetics for a variety of reactions	Materials Res. Bulletin 37 (2002) 1025–1032
Penn State University	Sridhar Komarneni	nanostructure synthesis	Se, metal lead, and CdS nanorods	MARS 5	double-walled: Teflon & polyetherimide	dependent on material in use	dramatic increase in reactions rates	J. Mater. Res., Vol. 19, No. 6, Jun 2004
Penn State University	Sridhar Komarneni	nanopowder synthesis	silver metal powders	MARS 5	Teflon-lined (Dupont)	yield checked at various intervals	1 – 2 order of magnitude kinetics increase	J. Mater. Res., Vol. 18, No. 4, Apr 2003
National Chemical Laboratory	H. S. Potdar	nanopowder synthesis	blue-white phosphor Sr_2CeO_4	MARS 5	HP-500/XP-1500 Plus	30 minutes of heating @ 200°C	permits synthesis of individual oxide nps	Materials Letters 58 (2004) 2521– 2524
National Chemical Laboratory	P. A. Joy	nanopowder synthesis	nanosized magnesium ferrite	MARS 5	XP-1500 Plus (double-walled Teflon)	25 minutes of heating @ 150°C	homogeneity, higher yield & reproducibility	Materials Letters 58 (2004) 1092– 1095
Korea Research Institute of Chemical Technology	Sang-Eon Park/Jong-San Chang	nanoparticle synthesis	nanocrystalline barium titanate	MARS 5	100 mL Teflon autoclave	30 min of heating @ 300 W	fast crystallization, cost efficiency, clean tech	Materials Letters 58 (2004) 3161–3165
National Nano Device Laboratory	Fu-Ken Liu	nanostructure synthesis	gold nanorods	MARS 5	unspecified sealed	5 minutes of heating at 100°C, 600 W	quite fast, simple, and very energy efficient	Materials Letters 58 (2004) 373– 377
National Chemical Laboratory	S. A. Mirji	nanopowder synthesis	$La_{0.5}Ba_{0.5}MnO_3$ powder	MARS 5	XP-1500 Plus (double-walled Teflon)	30 minutes of heating @ 200°C	reduction in both reaction temp. and time	Materials Letters 58 (2004) 837– 841
National Chemical Laboratory	S. K. Date	nanopowder synthesis	various phases of Fe oxide powders	MARS 5	XP-1500 Plus (double-walled Teflon)	30 minutes of heating @ 190°C	better reliability and reproducibility	Materials Letters 57 (2002) 457– 462
Inha University	Sang-Eon Park	mesoporous material synthesis	cubic mesoporous silica SBA-16	MARS 5		120 minutes of heating @ 373 K	homogeneous heating and nucleation	Micro & Mesoporous Mats. 68 (2004) 21–27
Korea Research Institute of Chemical Technology	Jong-San Chang	zeolite synthesis	zeolite beta	MARS 5	Teflon autoclave	4 hours or less of heating @ 150°C	suppression of undesired phases	Micro & Mesoporous Mats. 68 (2004) 77–82
National Research Council	Andrea V. Firth	nanocomposite synthesis	CdSe/Polymer Nanocomposite	MARS 5 X		145°C	less hazardous, economic and efficient	J. Mater. Chem., 2005, 15, 4367 - 72
University of Modena	Federica Bondioli	nanopowder synthesis	$Ce_{0.9}Pr_{0.1}O_2$ nanopowders	MAS 7000		900°C, 15 min	increase yield, allows synth. of novel prods.	J. Mater. Chem., 2001, 11, 2620–2624
Université Paris-Sud	M. Gasgnier	low power microwave synthesis	$CuCrO_2$ and Cr manganese oxides	Maxidigest Prolabo 350	glass and quartz tubes	5 – 10 minutes of heating	syntheses at unusually low temp. & pressure	J. of Alloys & Compounds 358 (2003) 302–305
Università di Modena e Reggio Emilia	Federica Bondioli	nanopowder synthesis	Rutile and anatase nanopowder	MDS-200		195°C, 30 - 60 min	enhanced powder crystallinity, decr. time	J. Am. Ceram. Soc. **88** [9] 2639 - 41 (2005)
Korea Research Inst. of Chem. Tech.	Sang-Eon Park	mesoporous silica synthesis	MCM-41	MDS-2000	Teflon Autoclave	100 - 120°C, <10 min, 480 W	homogeneous heating and nucleation	Catalysis Today 44 (1998) 301 - 308
Università di Modena e Reggio Emilia	Federica Bondioli	nanopowder synthesis	Pr-doped Zirconia nanopowder	MDS-2000	Teflon-lined	2 hr, pressure-controlled	enhanced powder crystallinity, decr. time	J. Am. Ceram. Soc. **88** [3] 633 - 38 (2005)
Università di Modena e Reggio Emilia	Federica Bondioli	nanopowder synthesis	Zirconium Oxide powders	MDS-2000	Teflon-lined	≈200°C, 2 hr	energy savings, simplicity, cont. processing	J. Am. Ceram. Soc. **84** [11] 2728 - 30 (2001)
Queensland University of Technology	Geoffrey D. Will	nanostructure synthesis	titanium dioxide nanocrystals	MDS-2000	Teflon-lined digestion vessel	10 min, 60 psi (145°C)	rapid heating, extremely rapid kinetics	J. Mater. Chem., 2002, 12, 1787–1791
New Jersey Institute of Technology	Somenath Mitra	nanostructure functionalization	Functionalized S-W C Nanotubes	MDS-205			reduced rxn time and number of steps	Carbon 43 (2005) 1015 - 20
New Jersey Institute of Technology	Somenath Mitra	SWNT composite synthesis	silicon carbide SWNT composite	MDS-205		10 min of heating	different, faster, and more efficient	Carbon 44 (2006) 2804–2808
Duquesne University	Jennifer A. Aitken	solid-state microwave synthesis	$AgInSe_2$, various purities	MDS-2100	9 mm fused-silica tube, sealed	3 one min intervals, 100% power	more economical, meta-stable products	Mat. Res. Bull. 42 (2007) 395 - 403
National Dong-Hwa University	Yen-Pei Fu	lithium ferrite combustion synthesis	$Li_{0.5}Fe_{2.5-x}Mn_xO_4$ ($0 \le x \le 1.0$)	MDS-81D	crucible	15 min of heating	heat generated within sample itself	J. of Alloys and Comp. 391 (2005) 185 - 89
National Dong-Hwa University	Yen-Pei Fu	luminescent europium powder preparation	$Y_3Al_5O_{12}$:Eu powders	MDS-81D	crucible	30 min of heating	imp. physical and luminescence properties	J. of Alloys and Comp. 402 (2005) 233 - 36
National Dong-Hwa University	Yen-Pei Fu	cathode material synthesis	spinel $LiMn_{2-y}M_yO_4$ powders	MDS-81D	crucible	100% power, 30 min	shorter heating time, simpler synth. process	J. of Alloys and Comp. 426 (2006) 228 - 34
Wu-Feng Institute of Technology	Cheng-Hsiung Lin	nanopowder synthesis	barium ferrite powders	MDS-81D	crucible	15 minutes at 520 W	heating mechanism fundamentally different	J. of Alloys & Compounds 364 (2004) 221–224

Wu-Feng Institute of Technology	Cheng-Hsiung Lin	nanopowder synthesis	strontium hexaferrite powders	MDS-81D	crucible	15 minutes of heating	heat generated within sample itself	J. of Alloys & Compounds 349 (2003) 228–231
Swami Ramanand Teerth Marathwada University	Anant L. Choudhari	zeolite synthesis	ZSM-5, an aluminosilicate zeolite	type not specified	PTFE (Teflon)	363 K maximum temperature	crystallization period duration cut in half	Materials Chem. and Phys. 82 (2003) 538–545
Laboratory of Materials Processing & Powder Metallurgy	Terhi A. Nissinen	nanostructure synthesis	spinel $MnCo_2O_4$	type not specified		moderate power, short duration	finer products than conventionally obtained	Journal of Power Sources 106 (2002) 109–115
Pohang University of Sciene and Tech.	Kun-Hong Lee	CNT field emitter array fabrication	Flexible CNT Field Emitter		Quartz Reactor		uniform, rapid, volumetric, selective heating	J. Am. Chem. Soc. **2005**, *127* , 8234 - 35
Univ. of California Santa Barbara	Craig J. Hawker/Galen D. Stucky	nanoparticle synthesis	Cross-Linked Polymeric NPs			70°C, 30 min	increased efficiency and control	J. Am. Chem. Soc. **2006**, *128* , 15054 - 55
Chinese Academy of Sciences	Di Huo	ceramic oxide synthesis	mixed $SrFeCo_{0.5}O_y$ powders		alumina crucible within quartz tube	sample-dependent	lower rxn temp., superior structure and prop.	J. Am. Ceram. Soc. **85** [2] 510 - 12 (2002)
University of Florida	George Christou	liquid-phase inorganic syntheses	Mn^{III} single-molecule magnet		sealed glass tube	110°C, 5 min	improved reaction rate and enhanced yield	*Inorg. Chem.* **2006**, *45* , 5272 - 74
University of Edinburgh	Euan K. Brechin	liquid-phase inorganic syntheses	crystalline octametallic cluster		sealed glass tube	120°C, 2 min	improved yield and reproducibility	*Inorg. Chem.* **2006**, *45* , 5281-5283
Lanzhou University	Hu-Lin Li	cathode material synthesis	Al-doped spinel-type $LiMn_2O_4$			20 min of heating	significantly decreased reaction time	Journal of Power Sources 154 (2006) 239–245
Helsinki University of Technology	Terhi A. Nissinen	microwave-assisted route synthesis	Catalyst spinel $MnCo_2O_4$			ignition or cycled heating (≤2 min)	rapid & energy-saving catalyst preparation	Chem. Mater. 2003, 15, 4974-4979