

Precautionary Matrix for Synthetic Nanomaterials

Version 1.0



Schweizerische Eidgenossenschaft
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Precautionary Matrix for Synthetic Nanomaterials

General information

Matrix completed by / responsible contact person	
Brief description of the considered nanospecific field (type of NPR, which surrounding, in which application)	
Considered (process) step (production, packaging, transport, further stages of processing, disposal, use...), brief description	
Passing on of the product to consumers	<input type="radio"/> yes <input type="radio"/> no
Are coated nanoparticles or nanorods (NPR) involved	<input type="radio"/> yes <input type="radio"/> no

NPR: nanoparticles or nanorods

A: relevant for workers

V: relevant for consumers

U: relevant for the environment

	Parameter classes	Parameter	Identifier	A	V	U	Appraisalment	Basis for appraisalment, applied measurement method
	Specific framework conditions	Nano-relevance		S1				
		Order of size of the primary particles (NPRs) in the materials (free, bound or agglomerated)	S1.1	x	x	x	<input type="radio"/> > 1nm, < 100nm <input type="radio"/> > 100nm, < 500nm <input type="radio"/> > 500nm (no nanoparticulate constituents)	
		Under the possible physiological conditions does deagglomeration of agglomerates to primary particles or agglomerates (<500nm) occur?	S1.2 _{A,V}	x	x		<input type="radio"/> yes / no agglomerates present in the material <input type="radio"/> no	
		Under the possible environmental conditions does deagglomeration of agglomerates to primary particles or agglomerates (<500nm) occur?	S1.2 _U			x	<input type="radio"/> yes / no agglomerates present in the material <input type="radio"/> no	
		Information on the life cycle		S2				
		Is the origin of the starting materials known?	S2.1	x	x	x	<input type="radio"/> yes <input type="radio"/> partly <input type="radio"/> no	
		Is there an evaluated precautionary matrix for the starting materials?	S2.2	x	x	x	<input type="radio"/> yes <input type="radio"/> partly <input type="radio"/> no	
		Is the future life cycle of the synthetic nanomaterials known?	S2.3		x	x	<input type="radio"/> yes <input type="radio"/> partly <input type="radio"/> no	
		How accurately is the material system known or can disturbing factors (e.g. impurities) be estimated?	S2.4	x	x	x	<input type="radio"/> precisely <input type="radio"/> not precisely <input type="radio"/> not known	

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Parameter classes	Parameter	Identifier	A	V	U	Appraisalment	Basis for appraisalment, applied measurement method
Potential effect	Potential effect	W					
	Redox activity and / or catalytic activity of the NPRs present in the nanomaterial (uncoated or coated)	W1	x	x	x	<input type="radio"/> low <input type="radio"/> medium <input type="radio"/> high/unknown	
	Stability (half-life) of the NPRs in the nanomaterial (uncoated) or of their coating under physiological conditions	W2 _{A,V}	x	x		<input type="radio"/> hours <input type="radio"/> days to weeks <input type="radio"/> months	
	Stability (half-life) of the NPRs in the nanomaterial (uncoated) or of their coating under environmental conditions	W2 _U			x	<input type="radio"/> hours <input type="radio"/> days to weeks <input type="radio"/> months	

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Exposure of human beings / input into the environment

Parameter classes	Parameter	Identifier	A	V	U	Appraisalment	Basis for appraisalment, applied measurement method
Physical surroundings		E1					
	Air	E1.1	x	x	x	O yes O no	
	Liquid media as aerosols <3 µm	E1.2	x	x	x	O yes O no	
	Liquid media (exposure via mouth, throat, stomach and intestine), aerosols >3 µm	E1.3	x	x	x	O yes O no	
	Liquid media (exposure via the skin)	E1.4	x	x	x	O yes O no	
	Solid matrix, not stable under conditions of use	E1.5	x	x	x	O yes O no	
	Solid matrix, stable under conditions of use, NPR mobile	E1.6	x	x	x	O yes O no	
	Solid matrix, stable under conditions of use, NPR not mobile	E1.7	x	x	x	O yes O no	
Exposure of human beings		E2					
	Possible amount of NPRs which an employee handles per day	E2.1	x			O low (<25µg) O medium (>25µg, <250µg) O high (>250µg)	
	Possible amount of NPRs with which an employee comes in contact in the worst case	E2.2	x			O low (<250µg) O medium (>250µg, <2500µg) O high (>2500µg)	
	Frequency with which an employee handles the NPR	E2.3	x			O monthly (low) O weekly (medium) O daily (high)	
	Amount of NPR which the consumer handles daily, via the utility product	E2.4		x		O low (<25µg) O medium (>25µg, <250µg) O high (>250µg)	
	Frequency with which a consumer uses the utility product	E2.5		x		O monthly (low) O weekly (medium) O daily (high)	
Input into the environment		E3					
	Annual amount of NPR disposed of as waste (via wastewater, exhaust gases, solid waste), which is not subjected to specific waste disposal	E3.1			x	O low (up to 5kg) O medium (5kg - 500kg) O high (more than 500kg)	
	Annual amount of NPRs in utility products	E3.2			x	O low (up to 5kg) O medium (5kg - 500kg) O high (more than 500kg)	