

Chemistry at Rotterdam University of Applied Science



Dr. C.B. Minkenbergh and Dr. H. Hijnen
Senior lecturers and researchers

ROTTERDAM UNIVERSITY

Organisation:

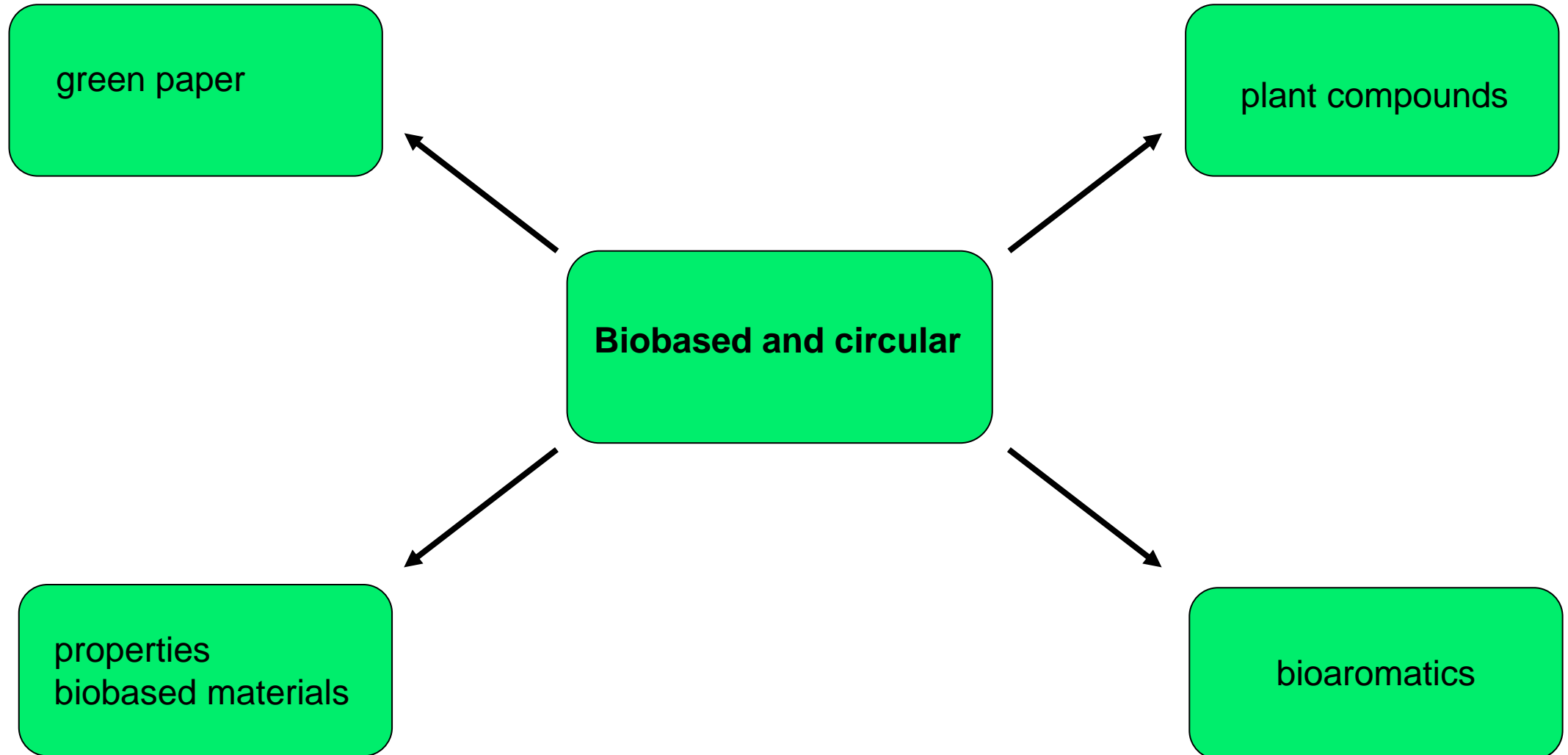
- ✓ Faculty of Engineering and Applied Science (EAS)
- ✓ 8 Technical bachelor programs (4 year program)
- ✓ Chemistry

Research:

- ✓ In analytical and physical chemistry, organic chemistry and biochemistry
- ✓ Chemistry related questions from companies!
- ✓ Together with students
- ✓ Multidisciplinary research

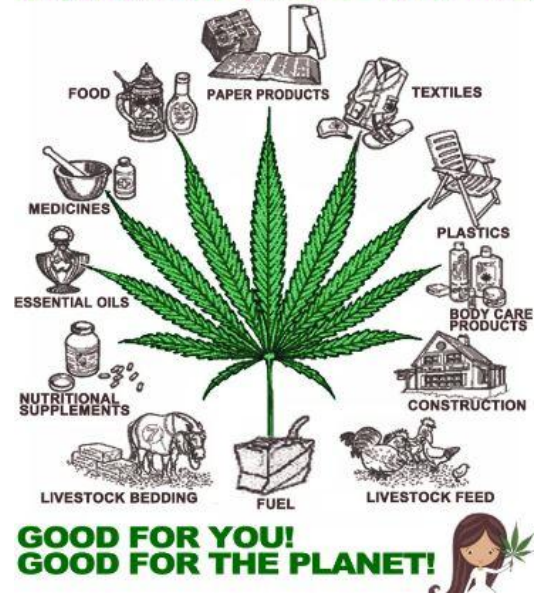


COMMUNITY OF PRACTICE



BIOAROMATICS

HEMP 50,000 USES & BENEFITS



- ✓ Physical-chemical separation methods and isolation of target molecules (sugars, proteins, cellulose, lignine)
- ✓ Isolated molecules can act as organic solvent, reagent, rheology modifier, ...
- ✓ Isolated lignine can be chemically processed to obtain aromatics, important building blocks for the chemical industry ...

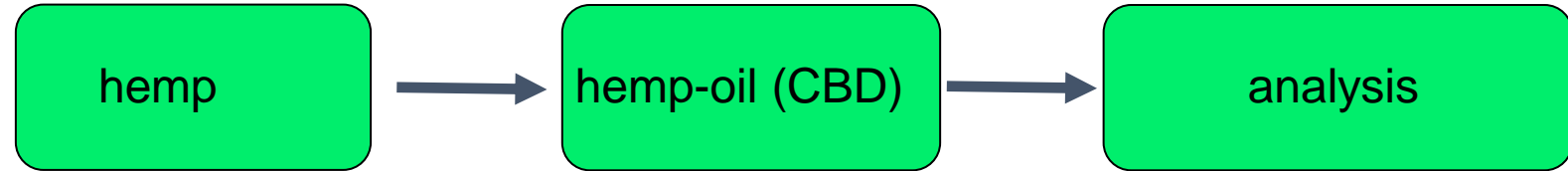
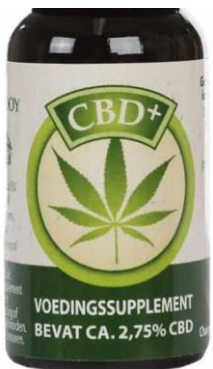
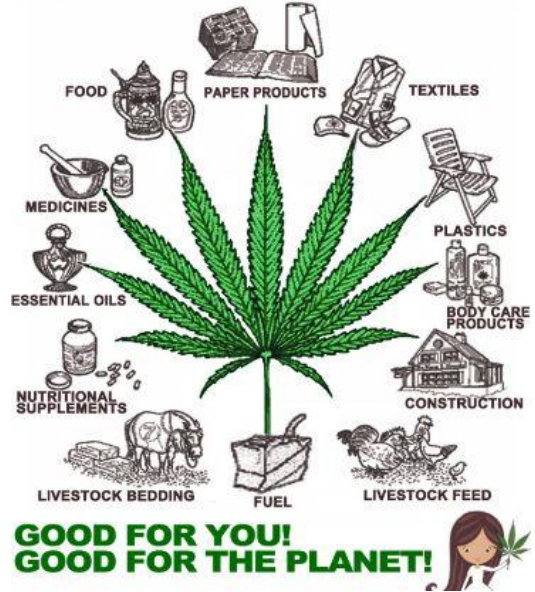
Partners: KCPK Rotterdam, Plantics

Focus Chemistry: Setting up extraction and analysis methods

Future partners: Chemical Technology for upscaling and chemical processing

PLANT COMPOUNDS

HEMP 50,000 USES & BENEFITS



- ✓ CBD-oil consists of a (complicated) mix of molecules, for instance terpenes
- ✓ Terpenes have many applications in medicine and as flavour additives
- ✓ Setting up analytical methods for analyzing the CBD-oil, qualitative and quantitative analysis
- ✓ Quality mainly depends on the harvesting time of the hemp

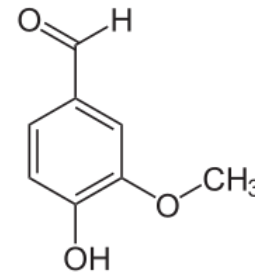
Partners: Trichome Biorefinery

Focus Chemistry: Chemical analysis and investigating the relation between quality and constitution of CBD-oil

PLANT COMPOUNDS



✓ Physical-chemical separation methods. For example: extracting vanilla from biological resources)



Partners: BML, WUR

Focus Chemistry: Setting up extraction and analysis methods

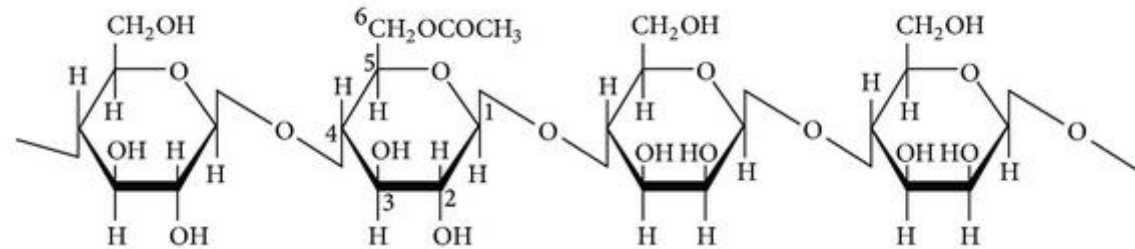
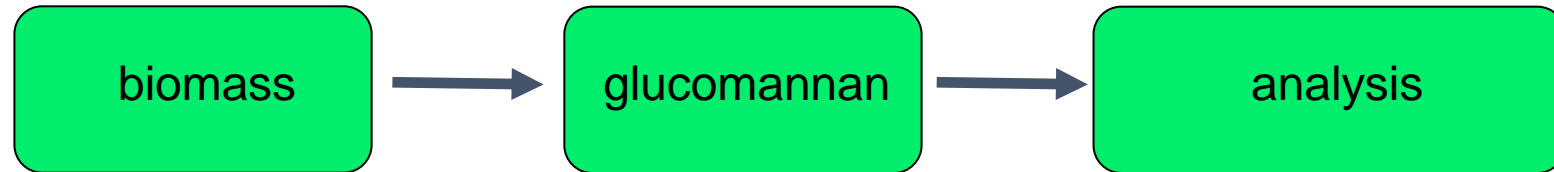
Status: Project just started

Future partners: Chemical Technology

PLANT COMPOUNDS



✓ Biochemical quantification methods. For example: quantifying glucomannans from biological resources)



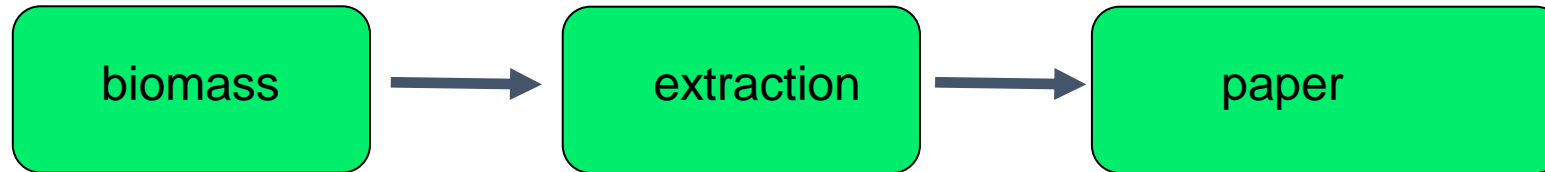
Partners: WUR

Focus Biochemistry: Setting up extraction and analysis methods

Status: Project just started

GREEN PAPER

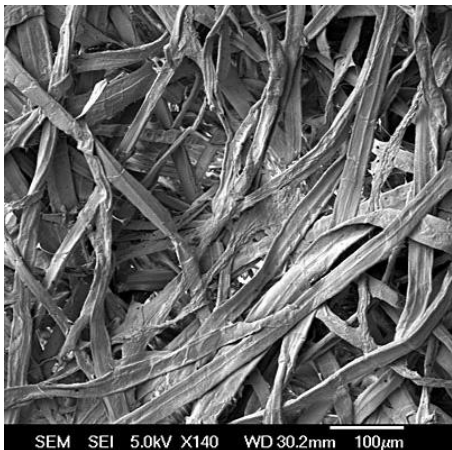
- ✓ Material properties green paper
- ✓ Analyzing molecular constitution of waste-streams



Partners: KCPK, Plantics

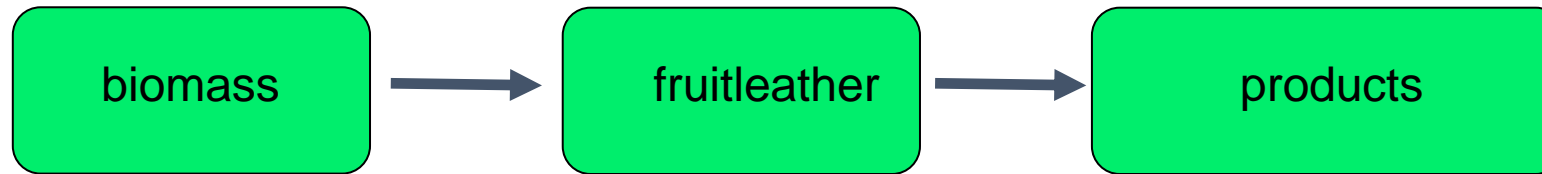
Focus Chemistry:

- Improve material properties green paper water-repellency, biodegradability etc.
- Investigate waste-streams (chemical analysis)



PROPERTIES BIOBASED MATERIALS

- ✓ PLA – based biopolymers
- ✓ Fruitleather
- ✓ Building with seawater (biocomposites)



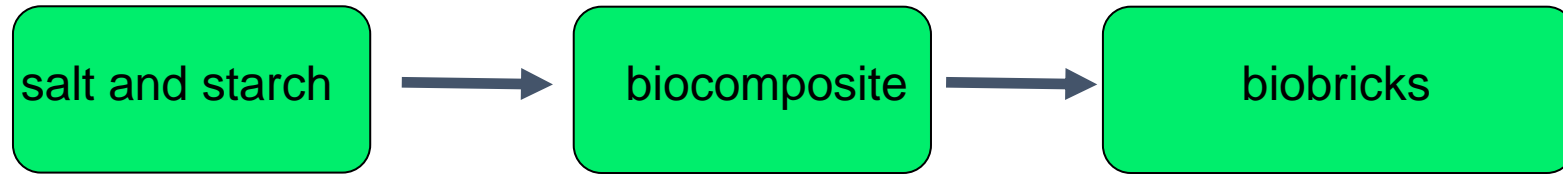
Partners: SuGu, Fruitleather Rotterdam

Focus Chemistry: Improve materialproperties fruitleather, mixing biopolymers for enhanced flexibility, water-repellency etc.



PROPERTIES BIOBASED MATERIALS

✓ Building with seawater (biocomposites)



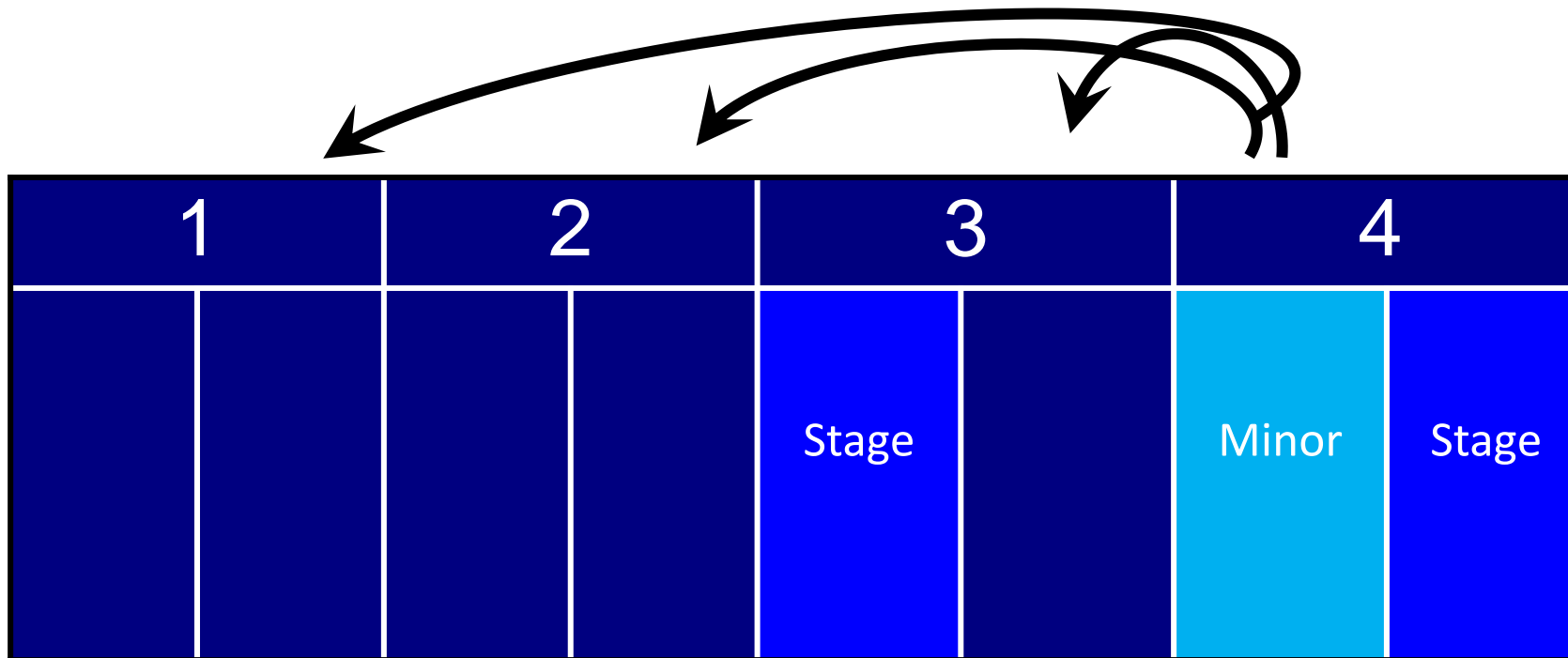
Partners: E. Geboers (The Salt Project)

Focus Chemistry: make composites water-repellent.



ORGANISATIE ONDERZOEK BIJ CHEMIE

- ✓ (Vervolg)projecten uit de EAS-COP minorprojecten
- ✓ Ook andere opleidings-gerelateerde projecten
- ✓ Op het gebied van analytisch-fysische chemie, organische chemie, biochemie en grensgebieden daartussen



ORGANISATIE ONDERZOEK BIJ CHEMIE

Waterproject
✓ Onderzoek aan metalen in (afval)water en slib
partner: Milieu Centrum Leiden (“Living Lab”)

1	2	3	4
		Stage	Minor Stage

Taalbeheersing en Literatuur
✓ Literatuurscriptie

Practicum Chromatografie & Spectroscopie
✓ Ringonderzoek
partner: Interscience, Applikon Metrohm,
andere opleidingen Chemie

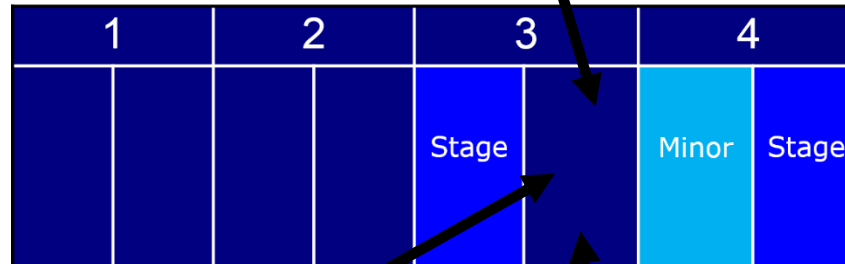
ORGANISATIE ONDERZOEK BIJ CHEMIE

Polymeerproject (synthese en karakterisering)

✓ Synthese en karakterisering polymerisatiesystemen

partners: o.a. Rijksuniversiteit Groningen,

Innovatiecentrum Kunststoffen (SuGu)



Project DNA/Biochemie

✓ Veilige Microbiologische Technieken

✓ PCR, InFusion cloning

✓ DNA analysis

Project Colloidchemie / Practicum Fysische Chemie

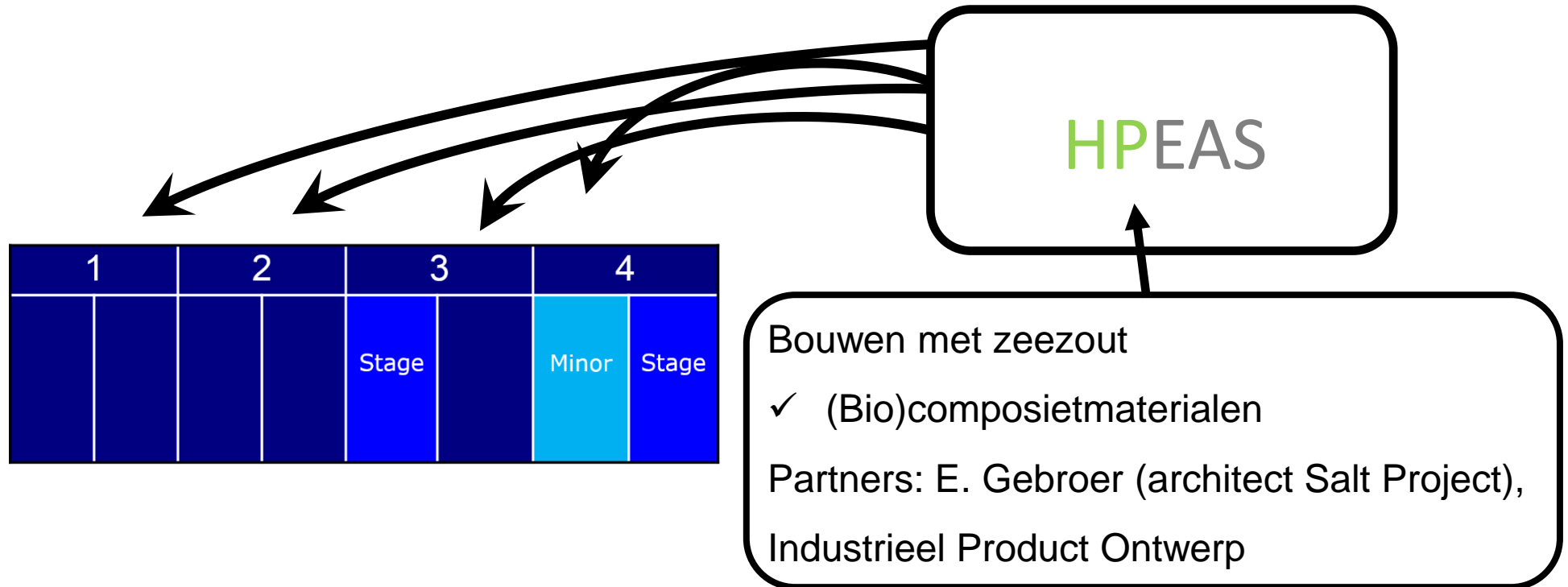
✓ Adsorptie en kinetiek

✓ Emulsies

✓ Soft Matter Chemistry

HONOURSPROGRAMMA BIJ CHEMIE

- ✓ Excellentie-traject voor studenten
- ✓ Onderzoeksprojecten die (nog) geen plek hebben binnen het curriculum



Is the future biobased??

