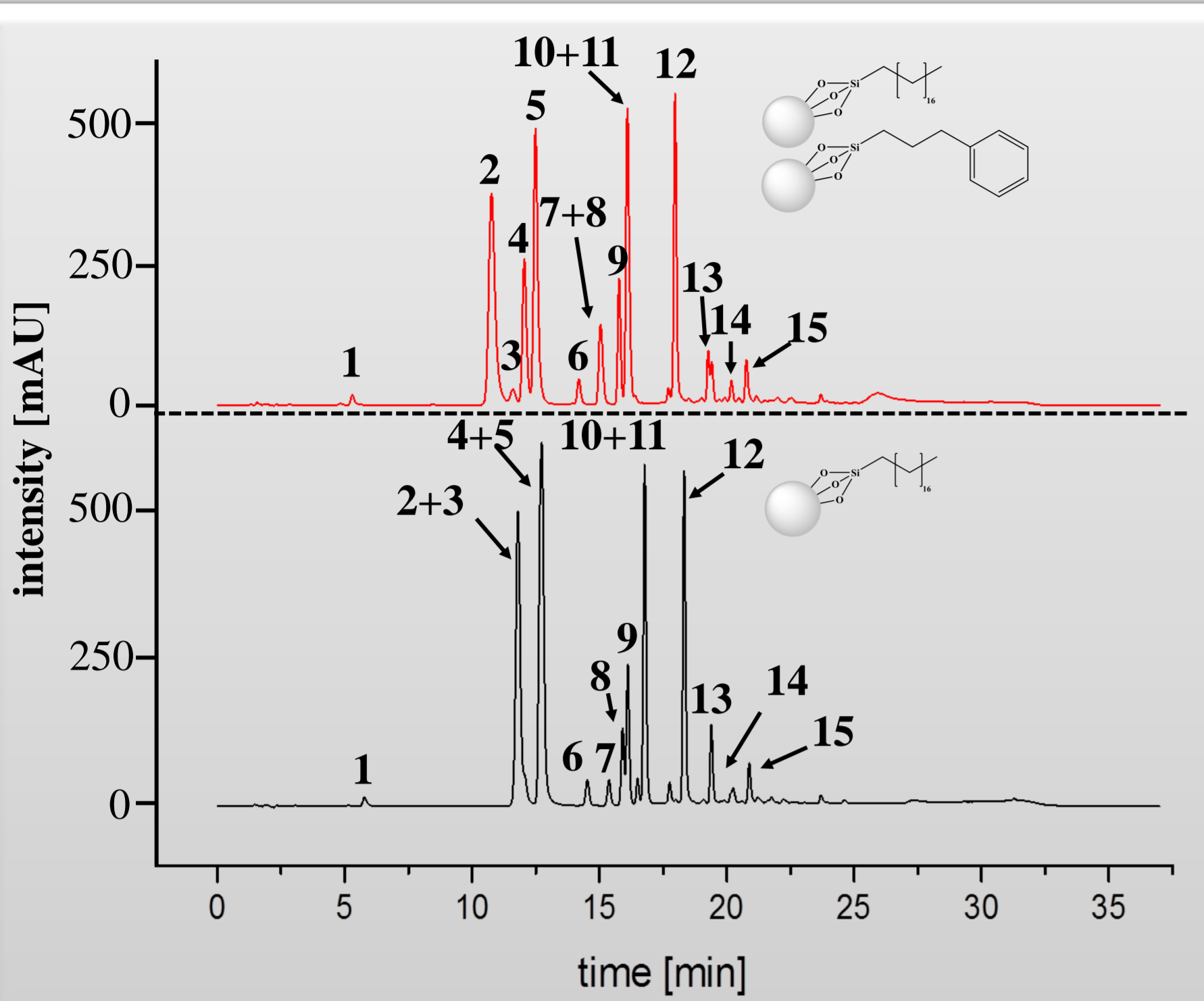


# Analysis and Characterization of Electrochemically Decomposed Lignin

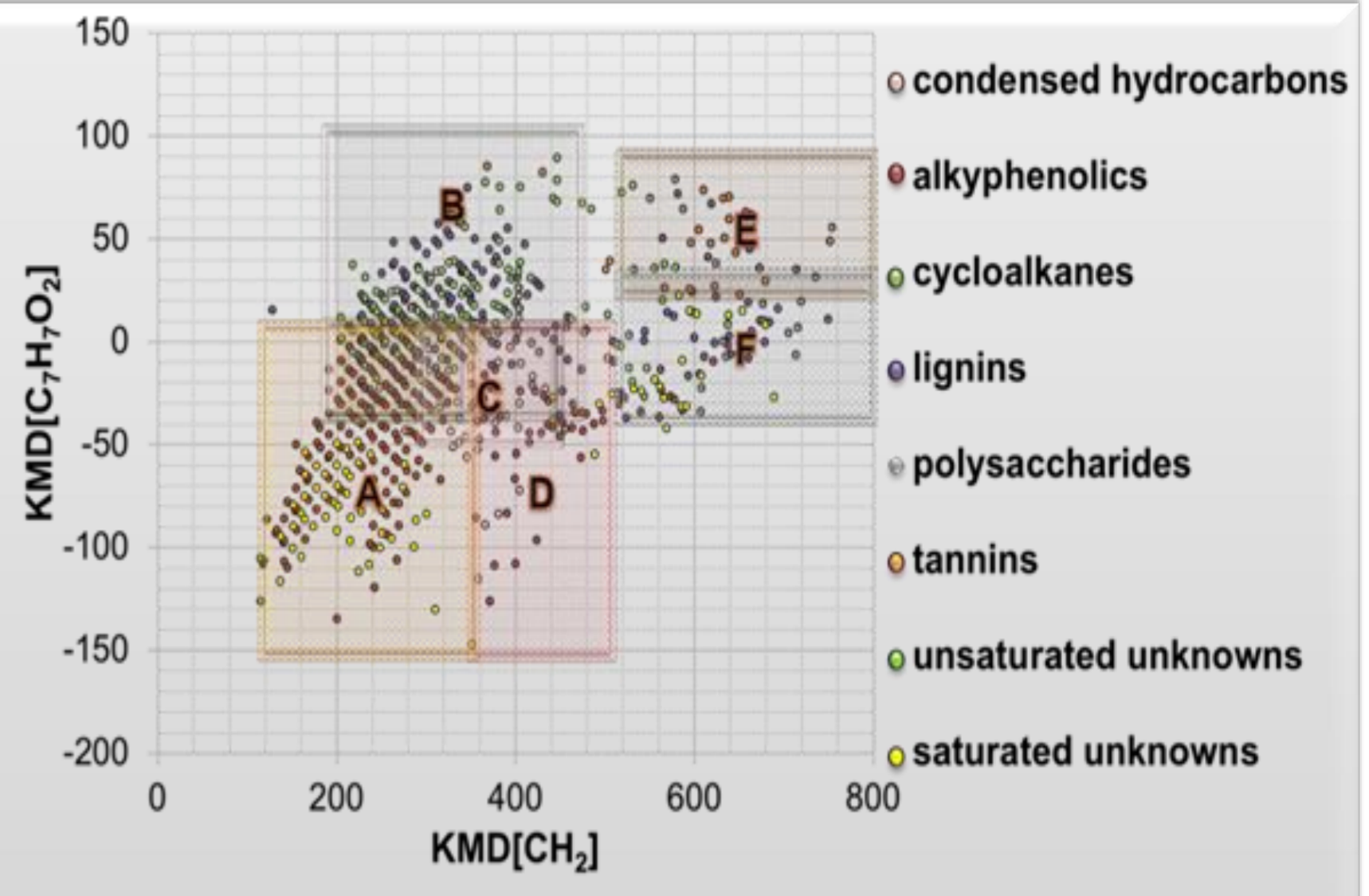
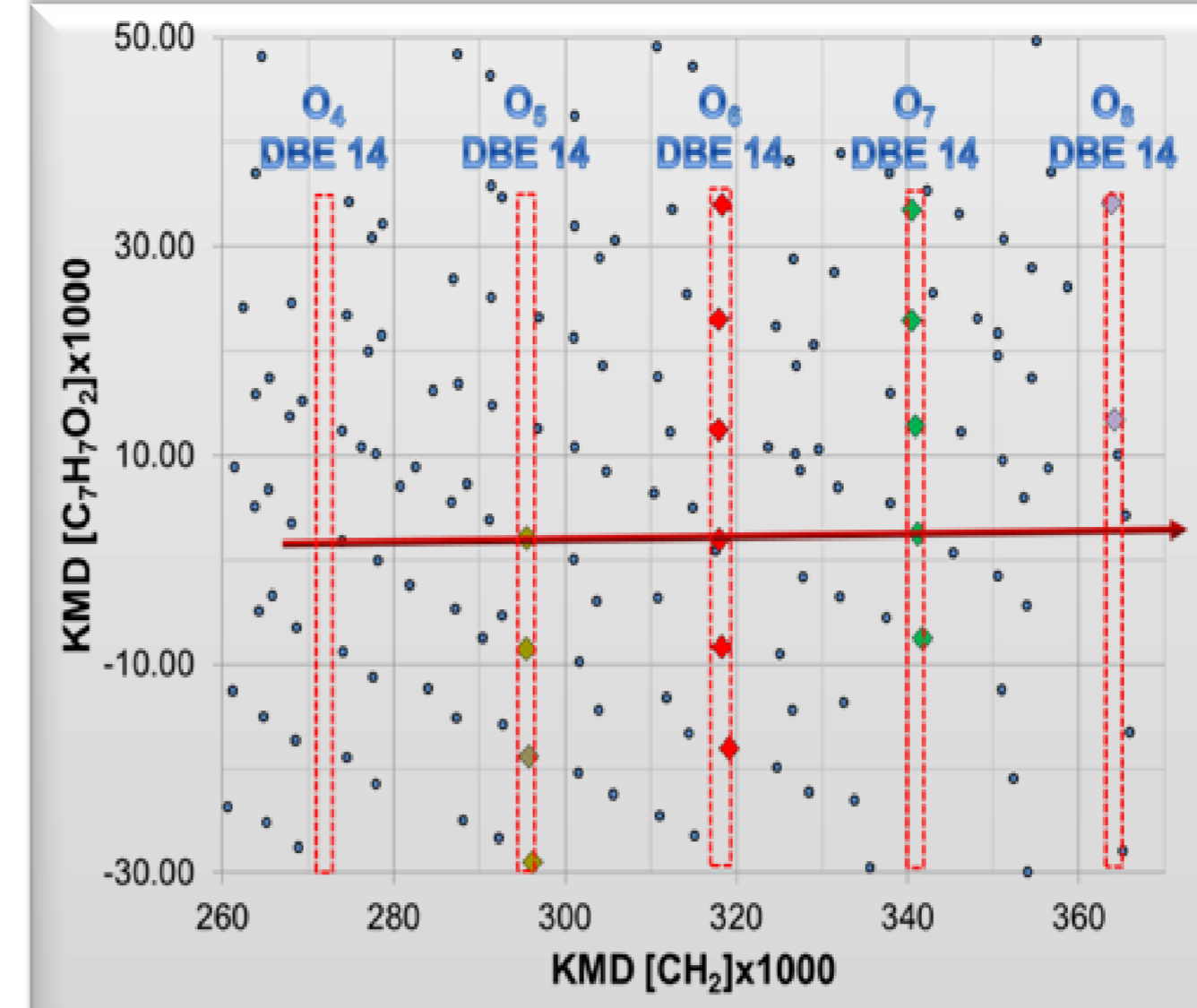


## Using Liquid Chromatography and High Resolution Mass Spectrometry

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number	compound
1	<i>p</i> -hydroxyphenyllactic acid
2	vanillic acid
3	homovanillic acid
4	syringic acid
5	4-hydroxybenzaldehyde
6	G-resinol-S
7	syringe aldehyde
8	<i>p</i> -coumaric acid
9	G-β-O-4-G alcohol
10	<i>trans</i> -ferulic acid
11	sinapic acid
12	3,5-dimethoxy-4-hydroxycinnamaldehyde
13	G-β-5-G alcohol
14	S-resinol-S
15	G-resinol-G



**Macro level: rapid regional differentiation of compound classes**  
**Micro level: structural classification of all members of linked compound series by identifying one single product of the series**

**Method optimization with standards**

**Silica based ionic liquid as stationary phase and commercial stat. phases for separation of isobaric content**

**Merge of the two optimized techniques**

**Modification of Kendrick mass defect plot to 2D mass defect plot**

**First dimension = KMD [CH<sub>2</sub>]**  
**Second dimension = KMD [C<sub>7</sub>H<sub>7</sub>O<sub>2</sub>]**

**Kendrick mass defect plot and collision induced dissociation (CID) for structure elucidation**

**Electrochemical decomposition using protic ionic liquids**

**Organic phase contains 653 different elemental compositions**

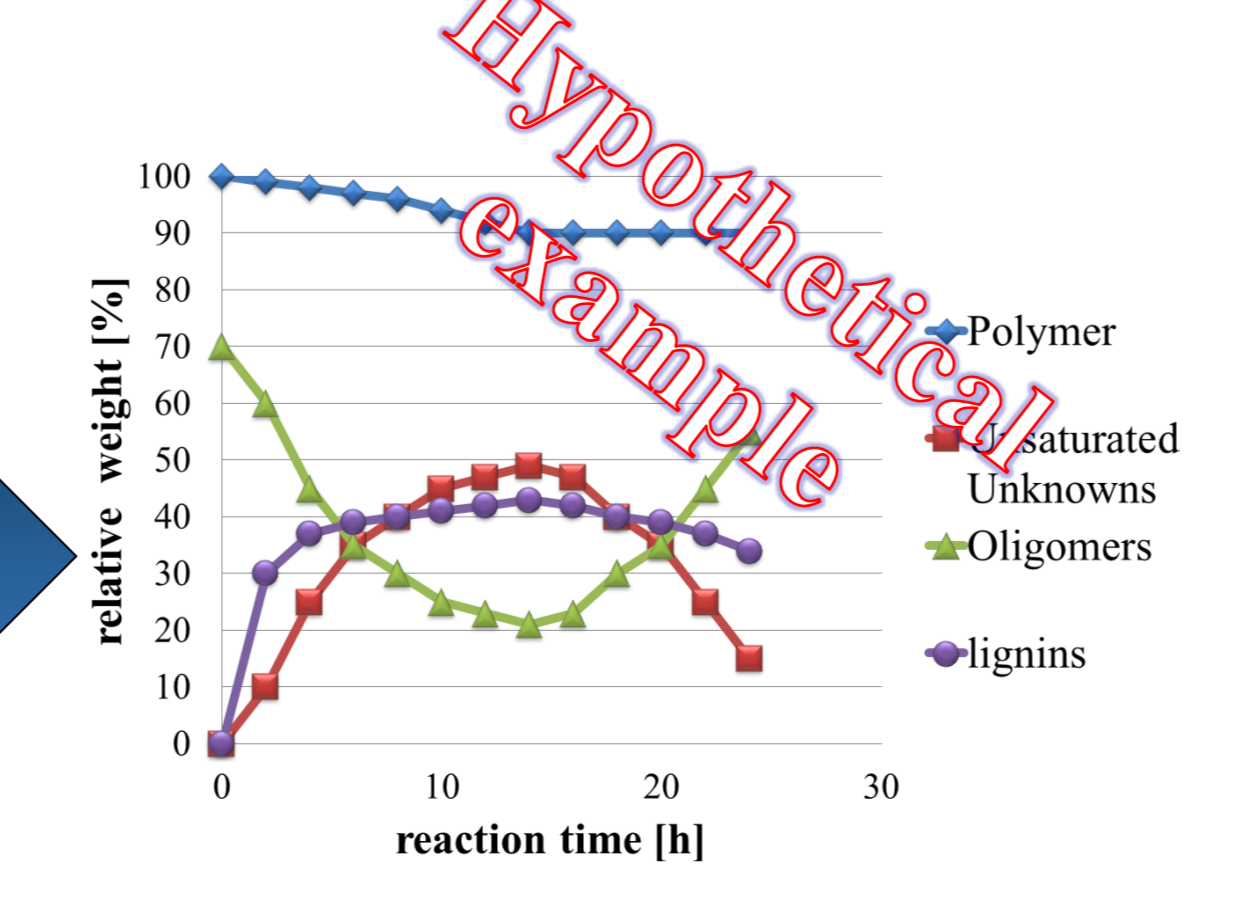
**Chromatographic separation**

**Process engineering**

**Reaction control of semi-continuous batch reactions using MALDI**

**Mass spectrometric data visualization**

**Monomeric lignin units: *p*-coumaryl alcohol (H), coniferol (G), sinapyl alcohol (S)**



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