

**Z 3**

**MS: Electrospray**      $M^{+\cdot} = 148$



**18**     Spur  $H_2O$  ?

**IR:**      $\sim 3550 \text{ cm}^{-1}$      Spur  $H_2O$  in KBr (Schulter)  
          $\sim 1630$

**3500 - 2400**      $O-H_{st}$       $N-H_{st}$   
                              stark H-verbrückt

$\sim 3000$       $C-H_{st}$

**1600**      $O-H_{def}$       $N-H_{def}$

**<sup>13</sup>C-NMR:**      73.4   70.2   41.7      ppm       $\geq 3 \text{ C}$   
                          CH<sub>2</sub>   CH<sub>2</sub>   CH<sub>2</sub>                            $\geq 6 \text{ H}$

**<sup>1</sup>H-NMR:**                      3.6      3.5      2.9      1.3      ppm  
 $\int$                       2 : 2 : 2 : 2      8 H  
                          CH<sub>2</sub>   CH<sub>2</sub>   CH<sub>2</sub>   XH

**Bilanz:**              3 C              36  
                          6 H              8  


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                          total              44              + 104 = 148

**MS: Electrospray**

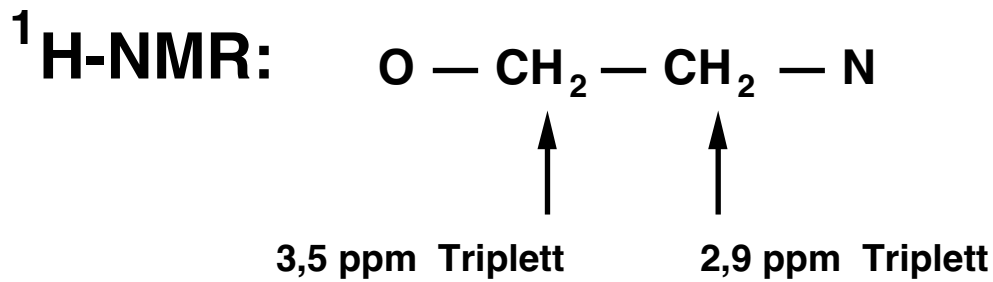
<sup>13</sup>C-Isotopensignal von M+H ist > 3%

⇒  $\geq 6 \text{ C}$  durch Verdoppelung der Integrale  
 im <sup>1</sup>H-NMR-Spektrum

**<sup>1</sup>H-NMR:**                      3.6      3.5      2.9      1.3      ppm  
 $\int$                       4 : 4 : 4 : 4      16 H  
                          CH<sub>2</sub>   CH<sub>2</sub>   CH<sub>2</sub>   XH  
                          CH<sub>2</sub>   CH<sub>2</sub>   CH<sub>2</sub>   XH

**Bilanz:**

6 C	72	
16 H	16	
total	88	+ 60 = 148



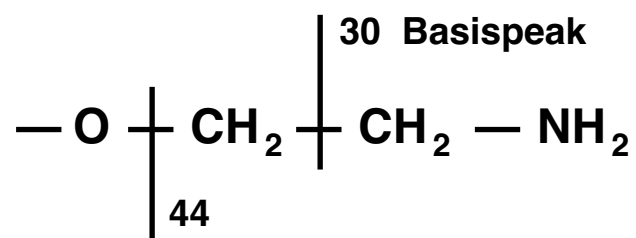
**Bilanz:**

6 C	72	
16 H	16	
1 N	14	
1 O	16	
total	118	+ 30 = 148

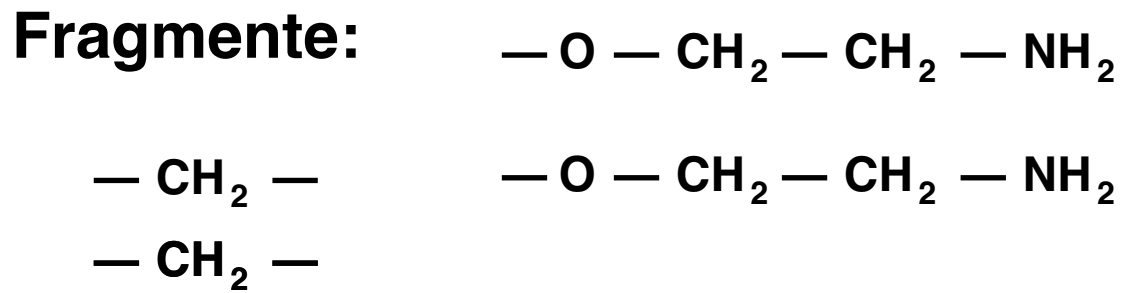
NO

**Summenformel:  $\text{C}_6\text{H}_{16}\text{N}_2\text{O}_2 \Rightarrow 0$  DBÄ**

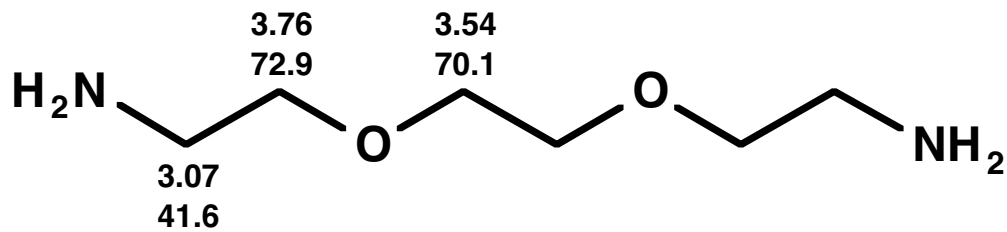
**MS:**



**zweimal im Molekül vorhanden**



**Struktur:**



**MS:**

