

1.1

1938

1986

2006

2011

1.2

LED

LED

2.2

3

24

55% 45

61%

2021

	35	36 45	46 55	56 60	61				
38	2	11	18	4	3	34	21	28	11
24	9	13	1	1	0	25	13	1	22
7	5	2	0	0	0	7	1	0	7
69	16	26	19	5	3				

Smaragdyrin

2.4

3.1

2020

1.

2.

Steven

/

1.

2.

3.

3.4

2019

2020

2021

2020

3

2021

3.5

2021

100

2021

2021

30

3.6

3.6.1

3.6.2

2021

9

87

91.4%

100%

2021

35

13

5

7

100

2021

Angew. Chem. Int. Ed. Chem. Soc.

Rev.

3

8

5.1

1

2

3

4

5

5.2

1.

2.

3.

4.