

Anorganisch-chemische Produkte I

- ▶ typische Massengüter als Fertigprodukte (z.B. Dünger, Glas, Baustoffe, Stahl)
- ▶ Zwischenprodukte mit hoher Einsatzbreite (z.B. Chlor, Säuren, div. Metalle)
- ▶ z.T. extrem hohe Tonagen (in 10^3 t/a) (klassische chemische Industrie)

	Welt (2023)	Deutschland VCI (2023)	weitere Einzelangaben
Chlor (Cl_2)	65 000	2 351	7 289 Europa, 2023
Ammoniak (NH_3)	146 000	1 719	
NaCl	270 000	17 500	
NaOH	50 000	2 490	
Soda	52 000	2 125	
HCl	20 000	1 527	
H_2SO_4 (SO_3)	231 000	2 831	19 000 China, 2023
Essigsäure (CH_3COOH)	22 000	29	
N-Düngemittel	90 800	5 216	
P-Düngemittel (P_2O_5)	43 000		
Kalisalze (K_2O)	29 100	2 962	
Al_2O_3		727	
TiO_2	6 560	245	

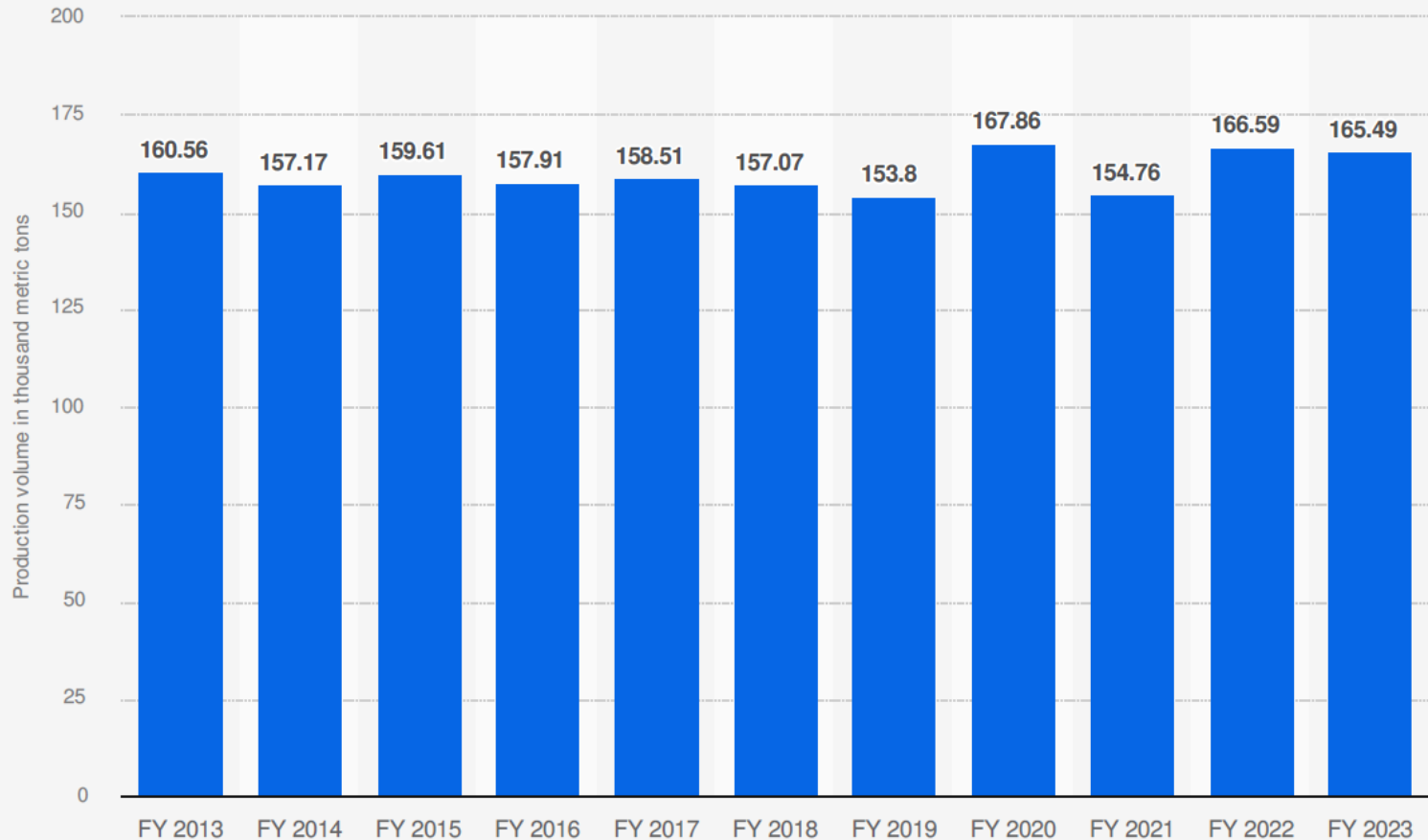
Essigsäure-Produktion in Deutschland

	Essigsäure Tonnen
2016	32 371
2017	31 922
2018	30 870
2019 ³	30 908
2020	32 540
2021	31 592
2022	31 544
2023	29 030

<https://www.vci.de/services/publikationen/jahresbericht-2023.jsp>

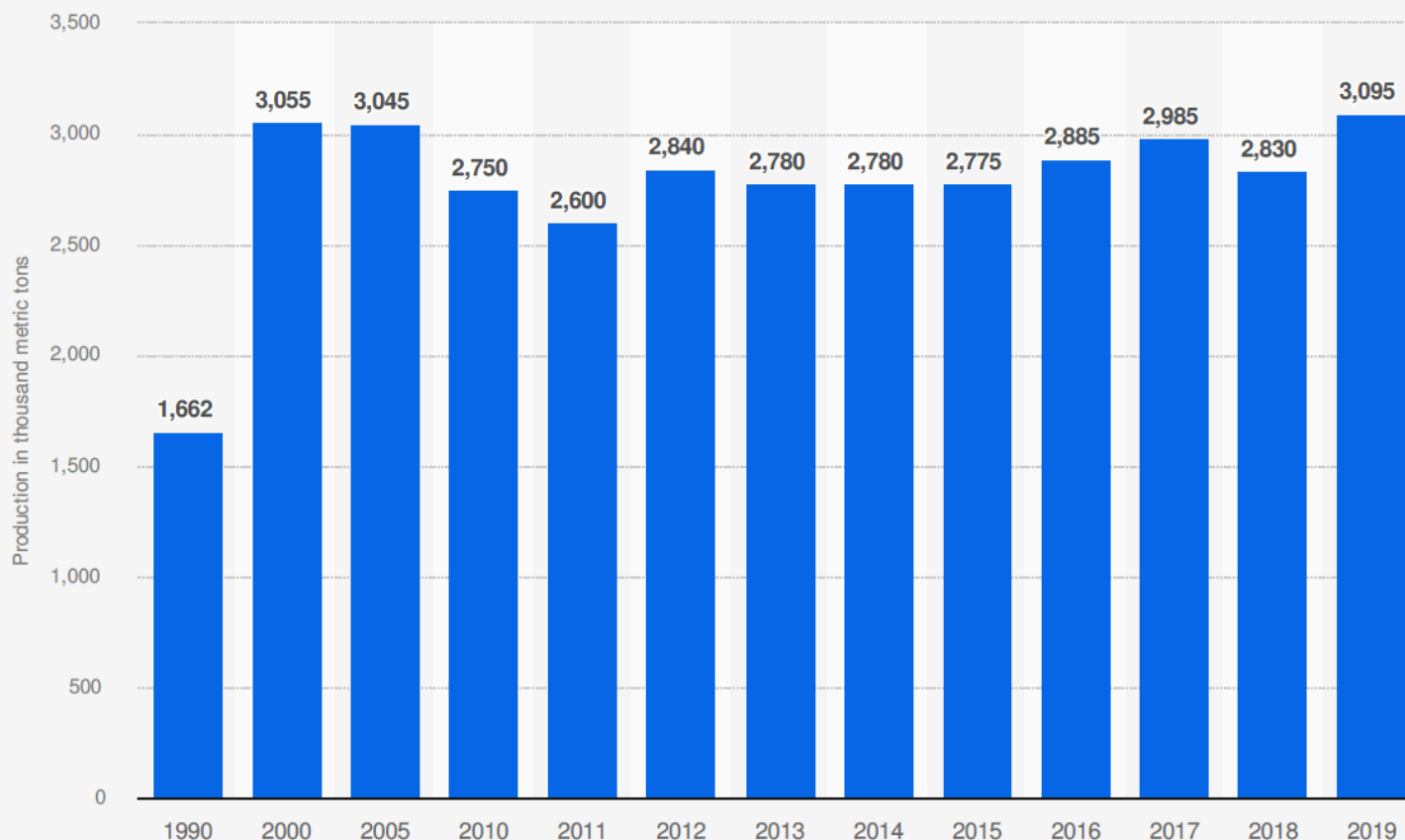
Essigsäure-Produktion in Indien

Production volume of acetic acid in India from financial year 2013 to 2023 (in 1,000 metric tons)



Essigsäure-Produktion in den USA

Acetic acid production in the United States from 1990 to 2019 (in 1,000 metric tons)



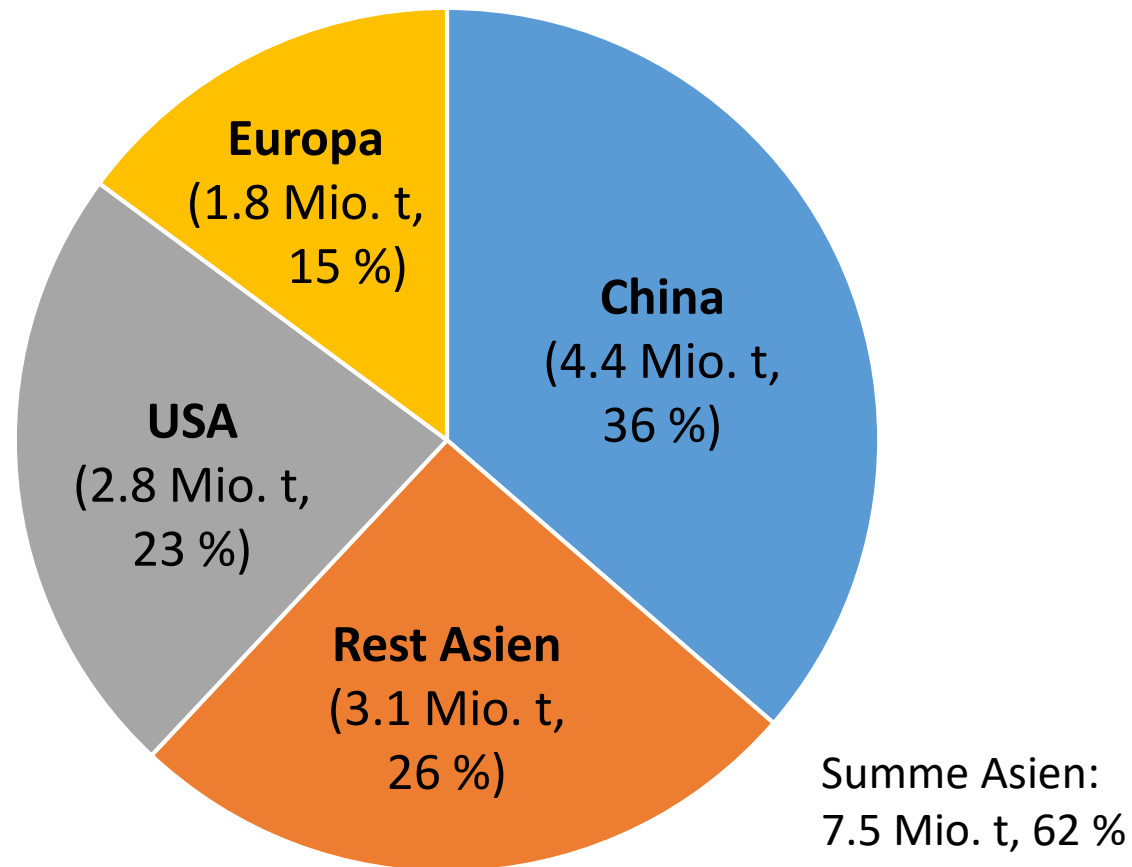
Sources

American Chemistry Council; US Census Bureau; US International Trade Commission; ICIS; IHS; FEB; AFPM; TFI; Various sources (Chlorine Institute, Rubber Manufacturers Association)

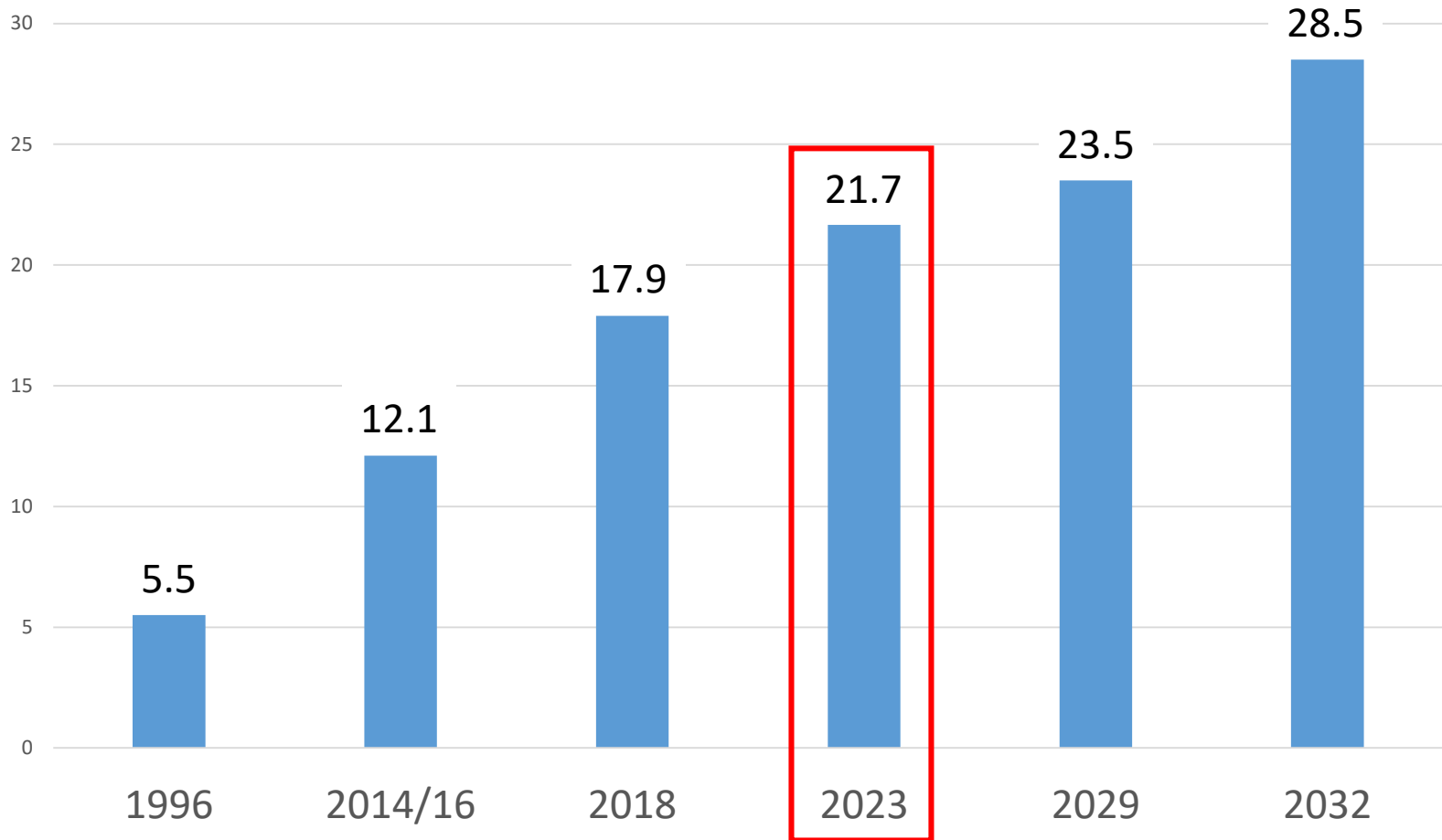
Additional Information:

United States; American Chemistry Council; US Census Bureau; US International Trade Commission; ICIS; IHS; FEB; AFPM; TFI; Various sources (Chlorine Institute, Rubber Manufacturers Association); 1990 to 2019

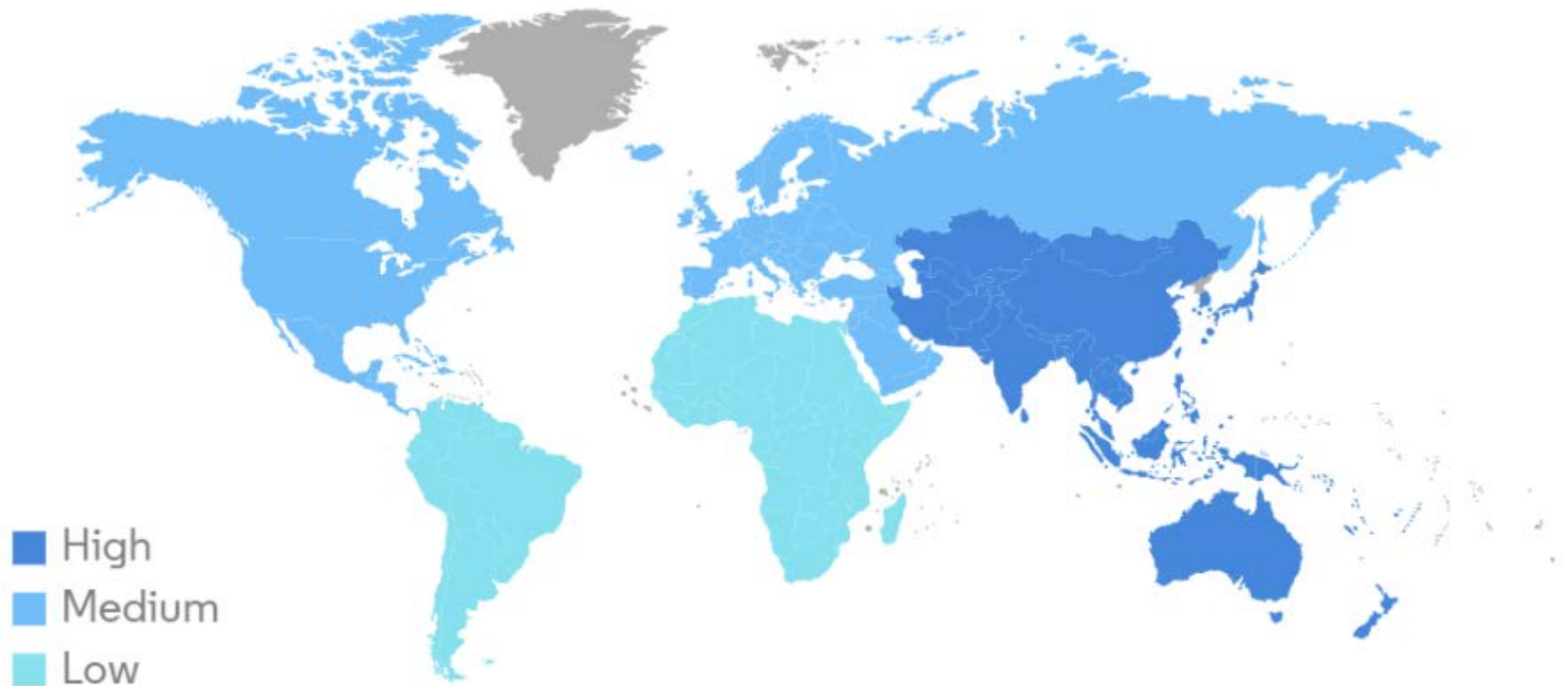
Weltweite Essigsäure-Produktion (2015/2016: 12 Mio. t)



Weltweite Essigsäure-Produktion (in Mio. t)



Globale Marktentwicklung Essigsäure (2023 – 2028)

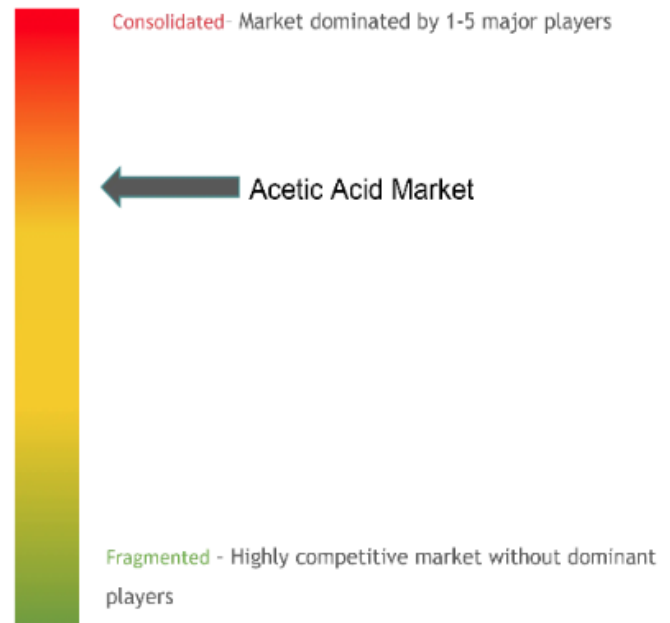


Source: Mordor Intelligence

Marktführer für Essigsäure

- 1 Celanese Corporation USA
- 2 INEOS UK
- 3 Jiangsu SOPO (Group) Co., Ltd. China
- 4 Eastman Chemical Company USA
- 5 Yankuang Group China

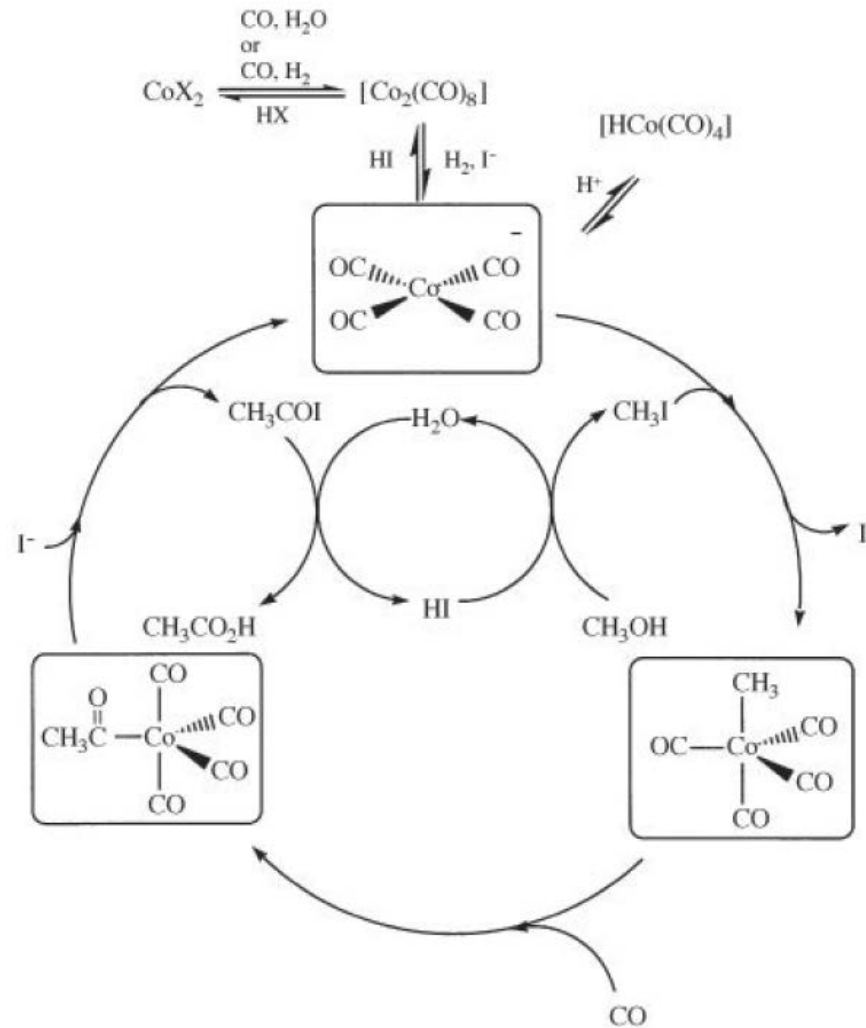
Market Concentration



Source: Mordor Intelligence



BASF-Prozess - Cobalt



BASF-Prozess - Cobalt

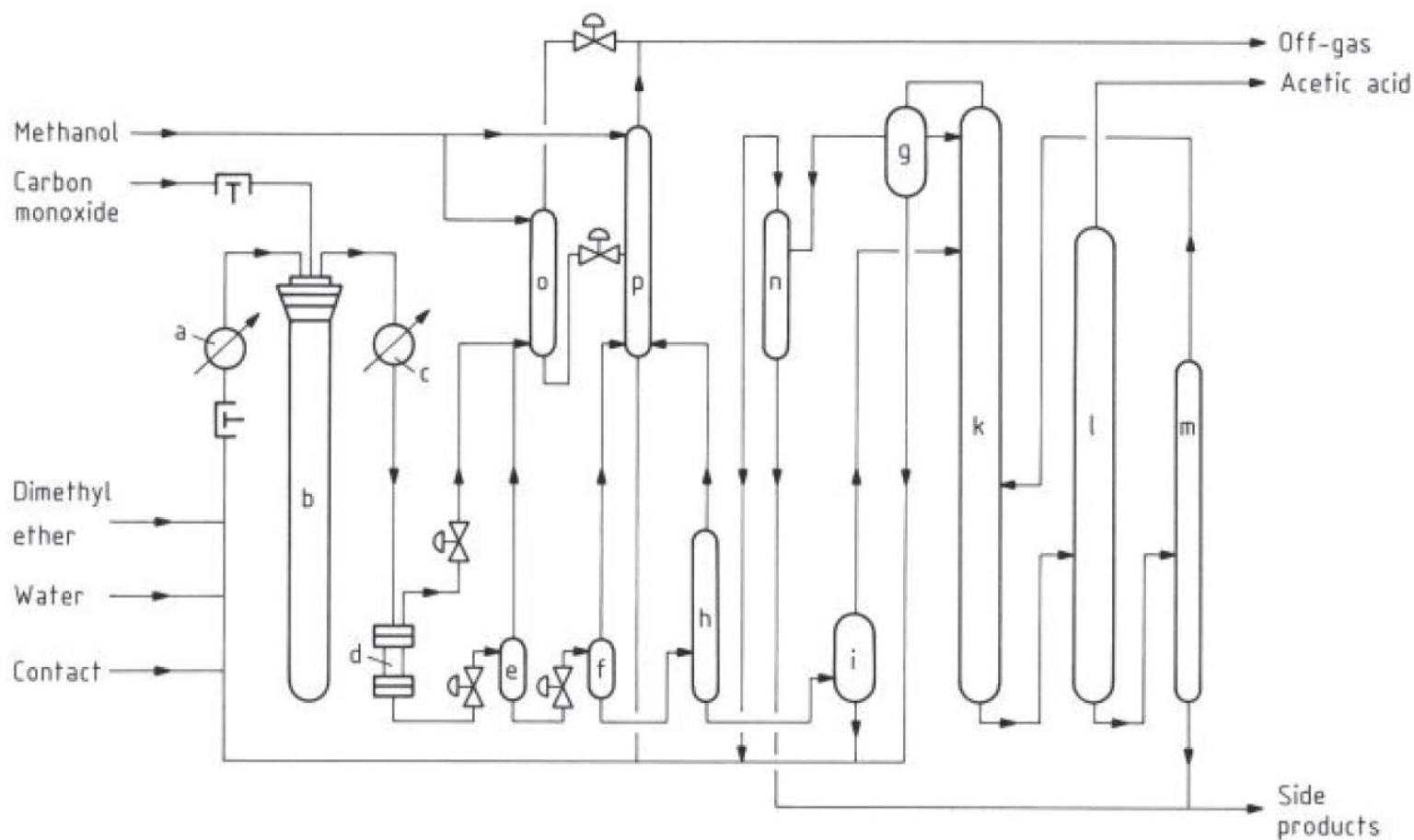
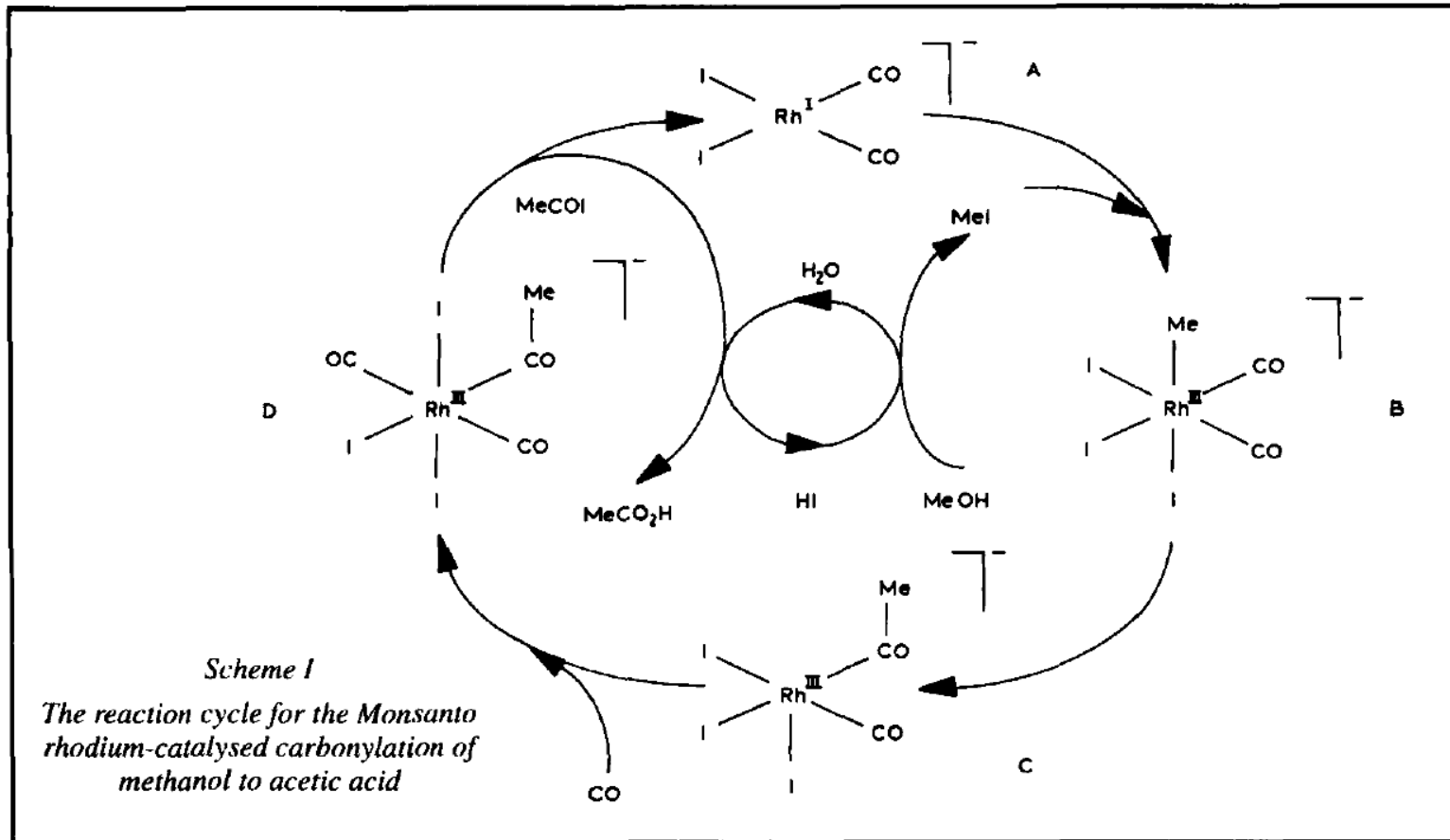


Figure 4. Production of acetic acid (BASF process)

a) Preheater; b) Reactor; c) Cooler; d) High-pressure separator; e) Intermediate pressure separator; f) Expansion chamber; g) Separation chamber; h) Degasser column; i) Catalyst separation column; k) Drying column; l) Pure acid column; m) Residue column; n) Auxiliary column; o) Wash column; p) Scrubbing column

Monsanto-Prozess – Rhodium



Monsanto-Prozess - Anlage

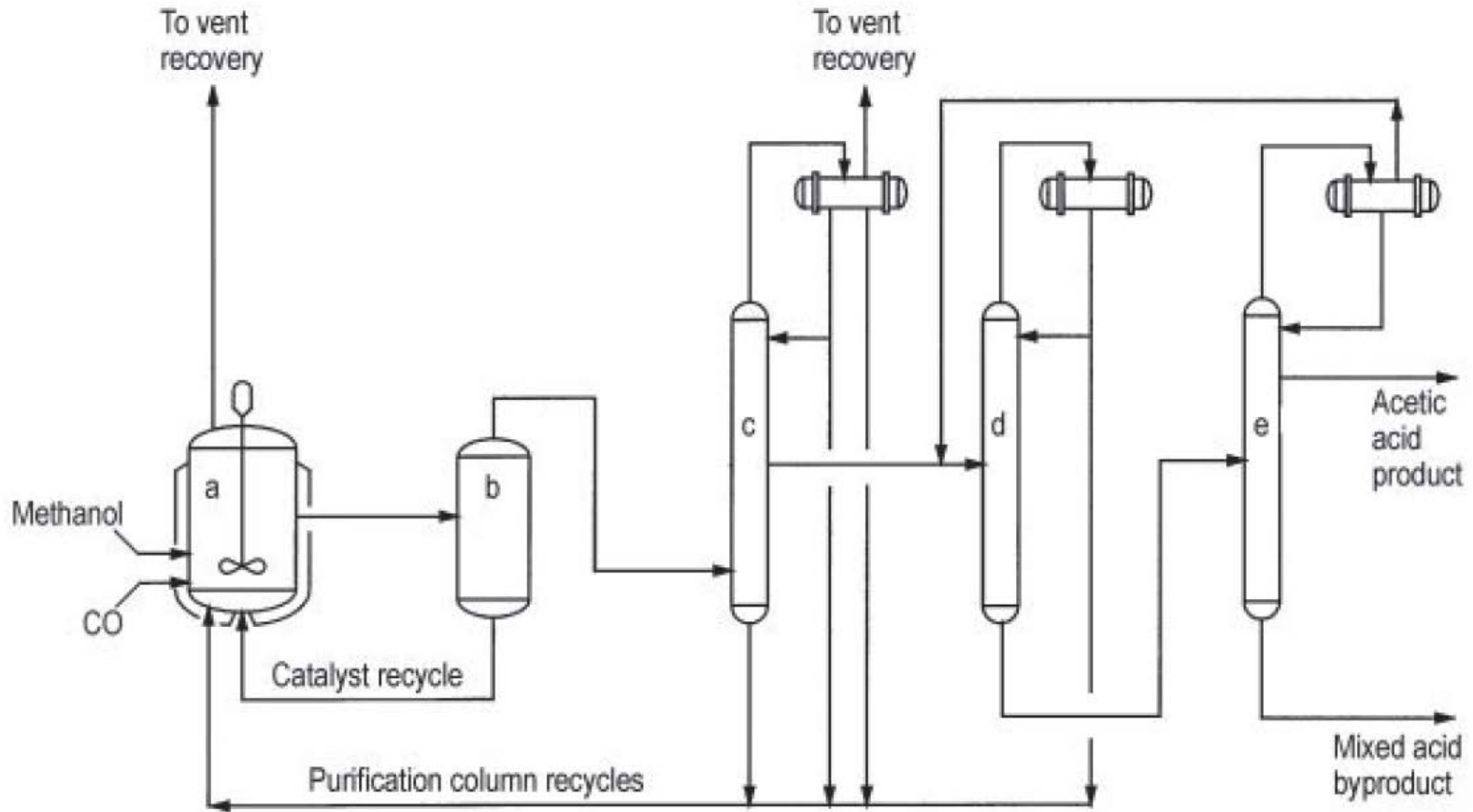


Figure 5. Production of acetic acid (Monsanto process)
a) Reactor; b) Flasher; c) Light-ends column; d) Dehydration column; e) Heavy-ends column

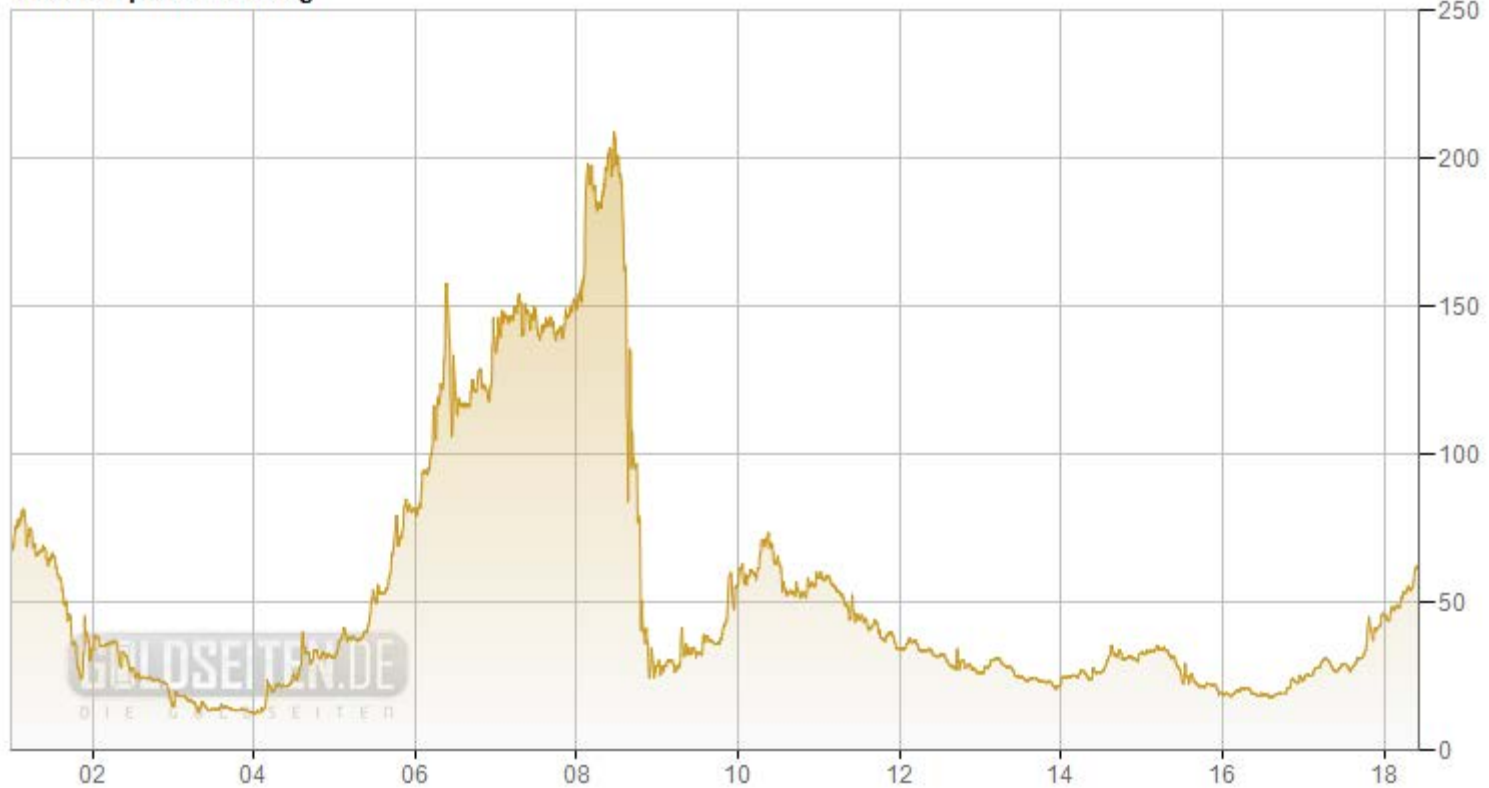
Monsanto-Prozess - Anlage



[3] *Platinum Metals Rev.* 2000, 44, 94

Edelmetallpreise – Rhodium (bis 2018)

Rhodiumpreis in Euro/g

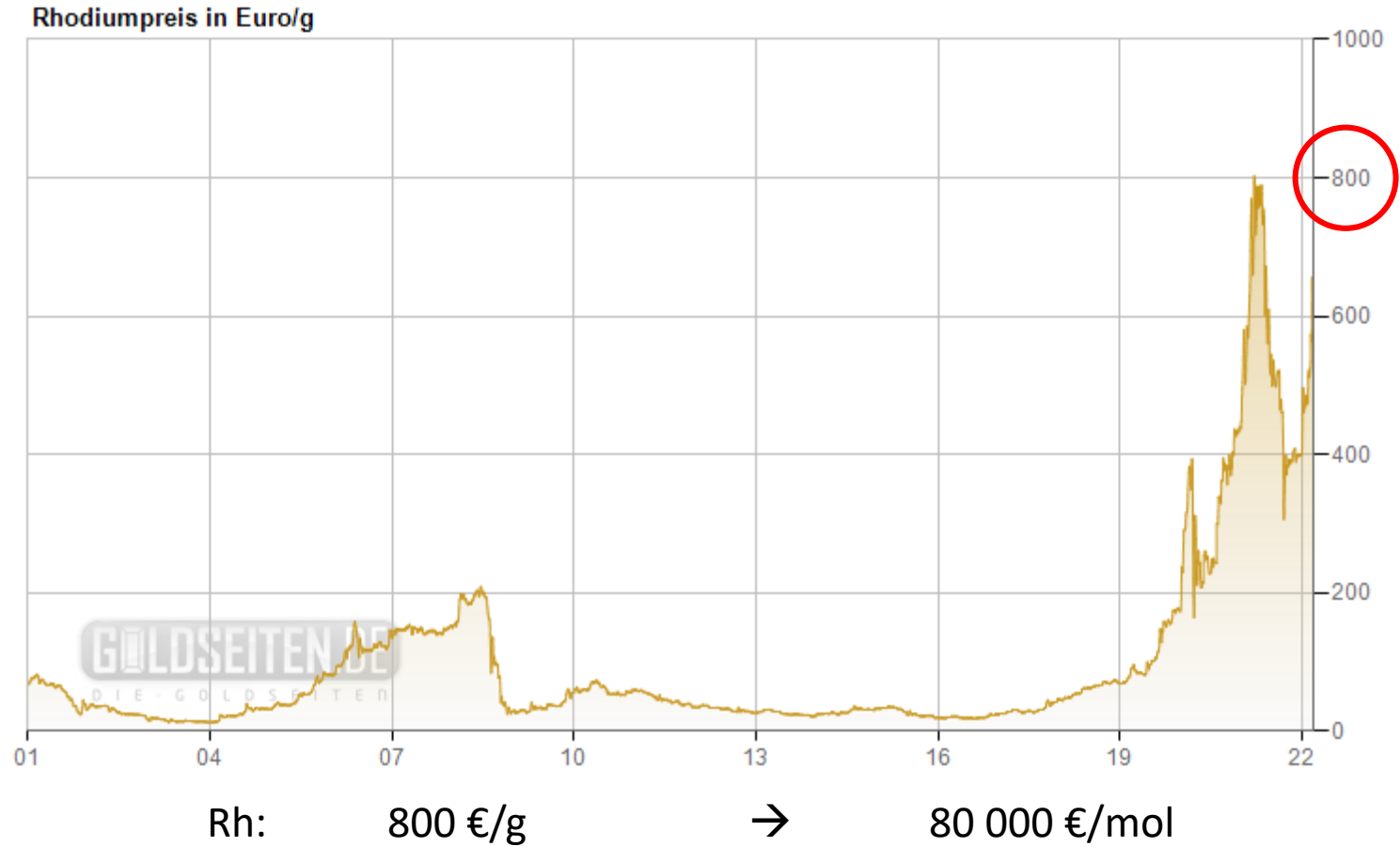


Rh: 62,58 €/g

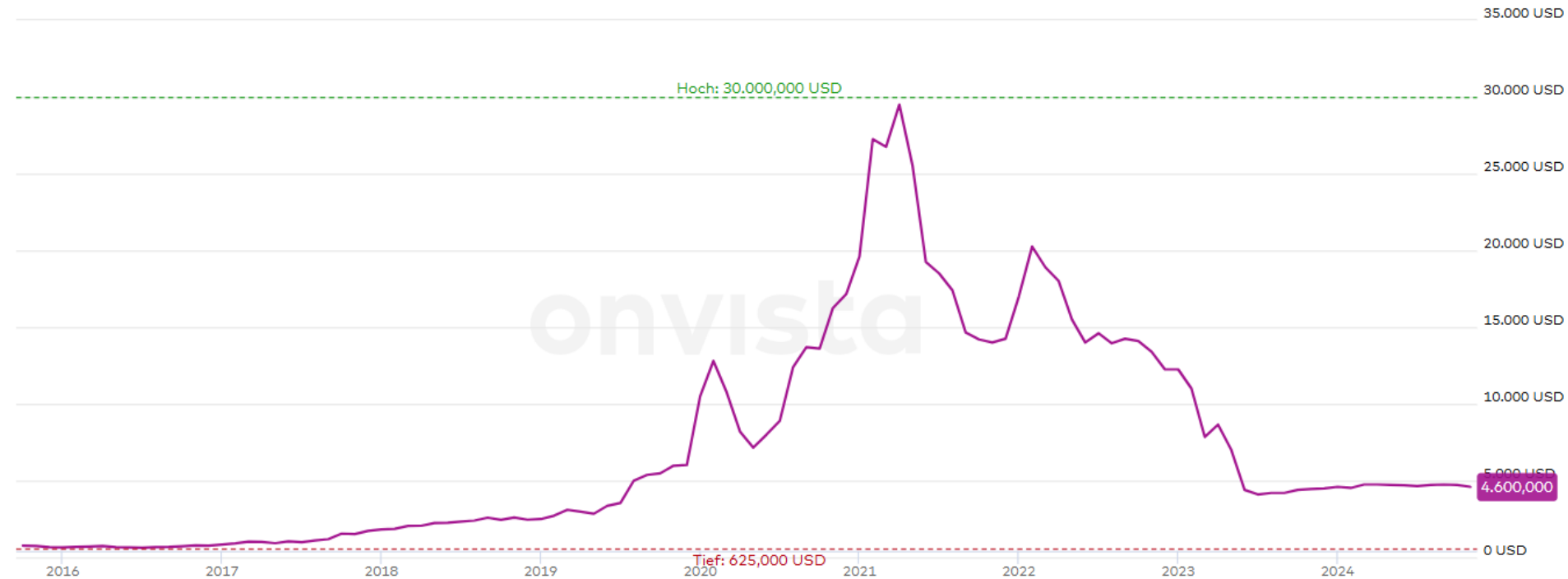


6 440 €/mol

Edelmetallpreise – Rhodium (bis 2022)



Edelmetallpreise – Rhodium



Rh: 141,93 €/g → 14 604 €/mol