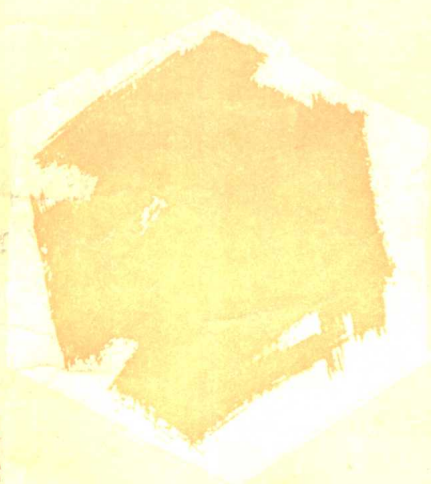


化学反应方程式

3000例



天津市红桥区教学研究室

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天津人民出版社

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前 言

“化学反应方程式——3000例”是中学化学教师、化工专业学校师生及自修化学专业的工具书。书中共收集了化学反应方程式和关系式3341个，表示连续进行化学反应的化学方程组合102个。

本书按无机化学反应和有机化学反应分类编排，无机化学反应方程式的编排顺序如下：

一、反应物按元素族分类，其顺序为卤族、氧族、氮族、碳族、碱金属、碱土金属、土金属和过渡元素（从ⅠB……Ⅶ）；

二、含同族元素的物质，按原子序由小到大的顺序编排（如卤族即按氟、氯、溴、碘的顺序编排）；

三、含同一元素的物质，按单质、氢化物、氧化物、碱、酸、盐的顺序编排；

四、两种以上物质间的化学反应方程式，按哪一物质所含的元素排在前边，就编入该元素的相应部分，然后，按另一物质所含元素先主族、后副族的顺序编排（即ⅠA、ⅡA……ⅢA，ⅠB、ⅡB……Ⅲ、0），含有相同酸根的盐类，也按这一顺序排列。

有机化学反应方程式是按烃、烃的衍生物、糖类、蛋白

质、高分子化合物的顺序编排的（部分方程式是关系式）。

书中的化学反应方程，只一般地注明必要的反应条件，生成物状态等，焓的变化从略。反应式中的〔O〕代表氧化剂，〔H〕代表还原剂。

本书由黄慎言、尹会元、王志毅、刘谟珅、陈志忠、张世林、周辛刚、徐祖迁等同志执笔编写，朱翰云、宁潜济同志审校。编写时主要参考书有：《重要无机化学反应》（陈寿椿编），《无机化学教程》（戴安邦等），《高等无机化学导论》（奈斯洛普和詹奈士），《有机化学》（苏企询编）、《有机化学》（邢其毅编），《有机化学》（南京大学）、《化学》（J.W.摩尔、W.G.大卫和R.W.柯灵）等。

由于编者水平所限，书中难免有疏漏、错误之处，诚恳地希望读者批评指正。

天津市红桥区教学研究室

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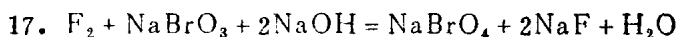
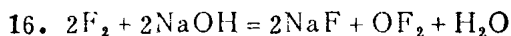
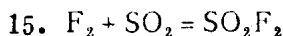
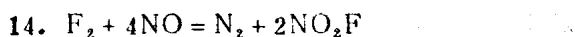
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一、无机化学反应方程式

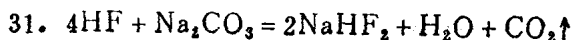
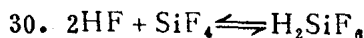
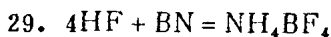
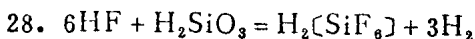
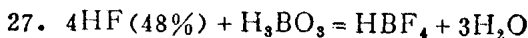
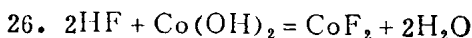
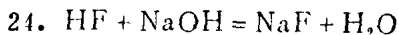
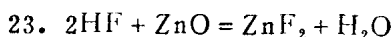
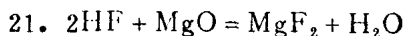
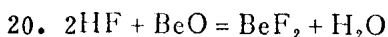
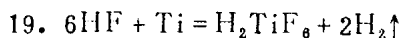
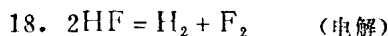
(一) 氟 (F)

(1) 单质

1. $F_2 + H_2 = 2HF$
2. $F_2 + 2Na = 2NaF$
3. $F_2 + 2K = 2KF$
4. $F_2 + Mg = MgF_2$
5. $F_2 + Ca = CaF_2$
6. $3F_2 + 2Al = 2AlF_3$
7. $2F_2 + Si = SiF_4$
8. $3F_2 + 2P = 2PF_3$
9. $5F_2 + 2P = 2PF_5$
10. $3F_2 + As = AsF_3$ (高温)
11. $6F_2 + 2S = 2SF_6$
12. $3F_2 + 8NH_3 = 6NH_4F + N_2\uparrow$
13. $2F_2 + 2H_2O = 4HF + O_2\uparrow$



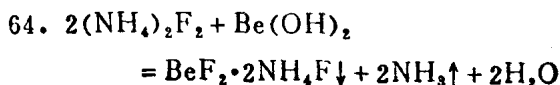
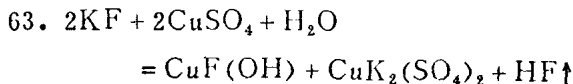
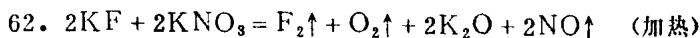
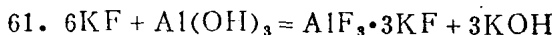
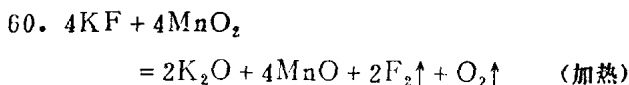
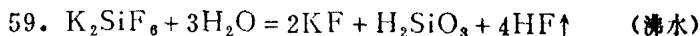
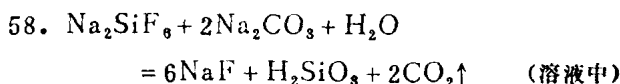
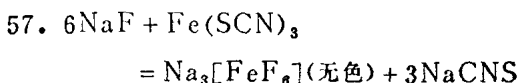
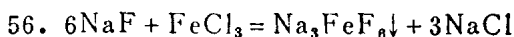
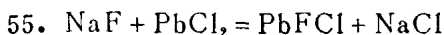
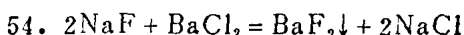
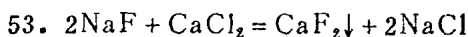
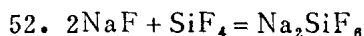
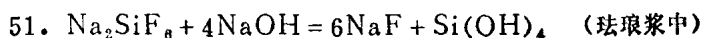
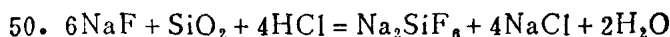
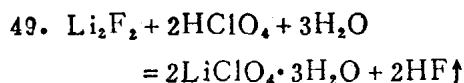
(2) 氢化物

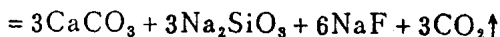
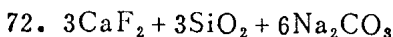
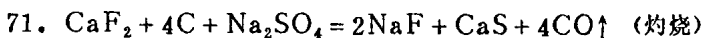
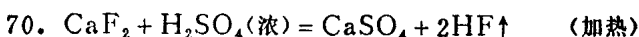
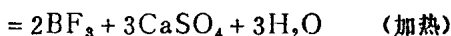
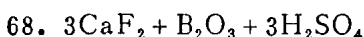
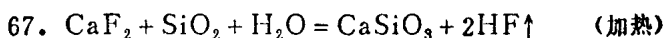
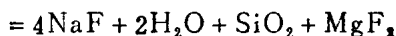
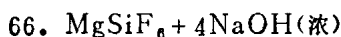
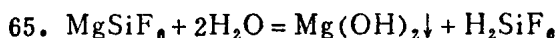


32. $2\text{HF} + \text{Cs}_2\text{CO}_3 = 2\text{CsF} + \text{H}_2\text{O} + \text{CO}_2\uparrow$
33. $6\text{HF} (40\%) + \text{Cs}_2\text{CO}_3 + \text{SnCl}_4 (\text{溶液})$
 $= \text{Cs}_2\text{SnF}_6 + 4\text{HCl} + \text{H}_2\text{O} + \text{CO}_2\uparrow$
34. $2\text{HF} + \text{MgCO}_3 = \text{MgF}_2 + \text{H}_2\text{O} + \text{CO}_2\uparrow$
35. $2\text{HF} + \text{CoCO}_3 = \text{CoF}_2 + \text{H}_2\text{O} + \text{CO}_2\uparrow$
36. $2\text{HF} + \text{NiCO}_3 = \text{NiF}_2 + \text{H}_2\text{O} + \text{CO}_2\uparrow$
37. $6\text{HF} + \text{Na}_2\text{SiO}_3 = 2\text{NaF} + \text{SiF}_4 + 3\text{H}_2\text{O}$ (玻璃浆中)
38. $6\text{HF} + \text{Na}_2\text{SiO}_3 = \text{Na}_2\text{SiF}_6 + 3\text{H}_2\text{O}$
39. $6\text{HF} + \text{CaSiO}_3 = \text{CaF}_2 + \text{SiF}_4\uparrow + 3\text{H}_2\text{O}$
40. $\text{HF} + \text{NaNO}_3 = \text{NaF} + \text{HNO}_3$ (25°C)
41. $6\text{HF} + \text{Ti}(\text{SO}_4)_2$ (黄色)
 $= \text{H}_2\text{TiF}_6$ (无色) + $2\text{H}_2\text{SO}_4$
42. $3\text{HF} + 2\text{K}_2\text{SeO}_4 = \text{KHSe}_2\text{O}_7 + 3\text{KF} + \text{H}_2\text{O}$
43. $2\text{HF} (\text{气}) + \text{K}_2\text{Cr}_2\text{O}_7 = 2\text{CrO}_3 + 2\text{KF} + \text{H}_2\text{O}$
44. $2\text{HF} + \text{K}_2\text{Cr}_2\text{O}_7 = 2\text{KCrO}_3\text{F} + \text{H}_2\text{O}$
45. $28\text{HF} + \text{CaNa}_2\text{Si}_6\text{O}_{14}$
 $= \text{Na}_2\text{SiF}_6 + \text{CaSiF}_6 + 4\text{SiF}_4\uparrow + 14\text{H}_2\text{O}$
- 或
- $28\text{HF} + \text{Na}_2\text{O} \cdot \text{CaO} \cdot 6\text{SiO}_2$
 $= 2\text{NaF} + \text{CaF}_2 + 6\text{SiF}_4\uparrow + 14\text{H}_2\text{O}$

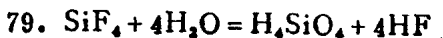
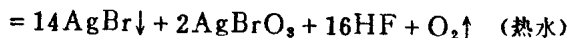
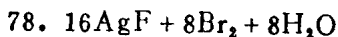
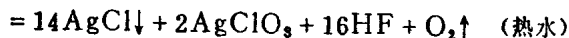
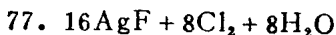
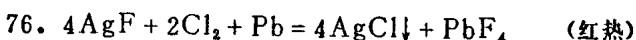
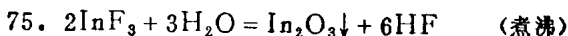
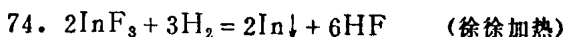
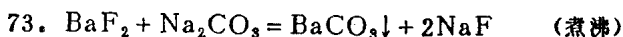
(3) 氟化物

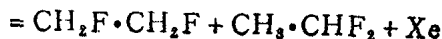
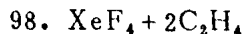
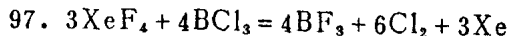
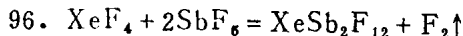
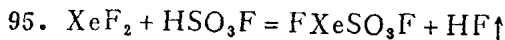
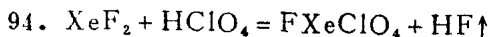
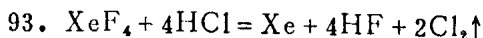
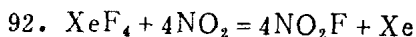
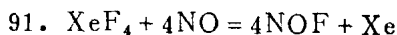
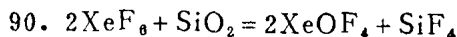
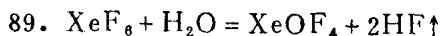
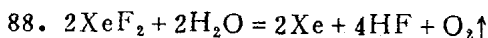
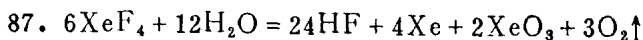
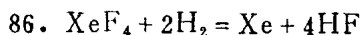
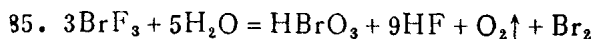
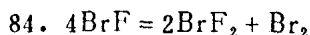
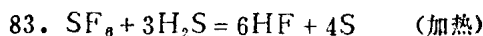
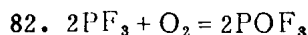
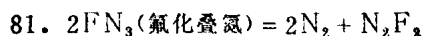
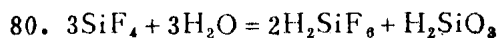
46. $\text{Li}_2\text{F}_2 + 2\text{HNO}_3 = 2\text{LiNO}_3 + 2\text{HF}\uparrow$
47. $\text{Li}_2\text{F}_2 + \text{H}_2\text{SO}_4 = \text{Li}_2\text{SO}_4 + 2\text{HF}\uparrow$ (加热)
48. $\text{Li}_2\text{F}_2 + 2\text{HNO}_3 + \text{H}_2\text{O} = (\text{LiNO}_3)_2 \cdot \text{H}_2\text{O} + 2\text{HF}\uparrow$

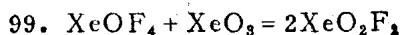




(灼烧)

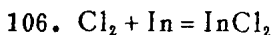
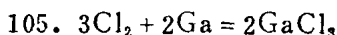
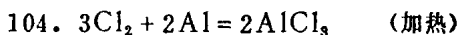
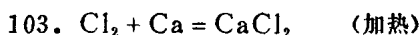
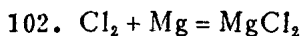
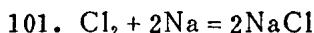
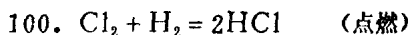




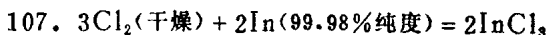


(二) 氯 (Cl)

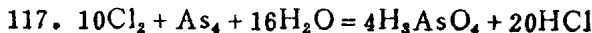
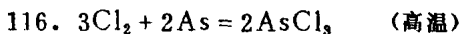
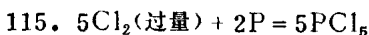
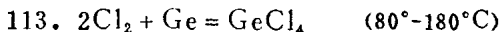
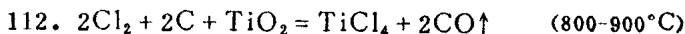
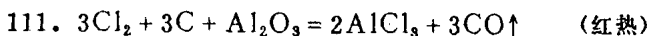
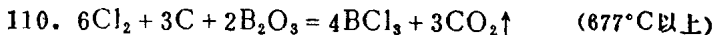
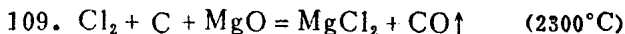
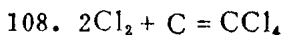
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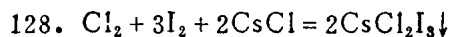
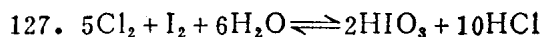
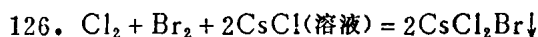
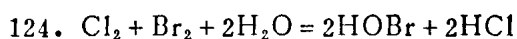
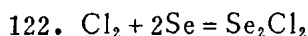
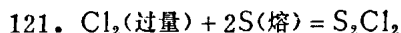
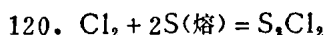
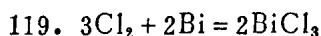
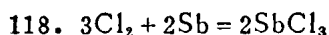


(与蔗糖炭混和, 在氯气流中加热)



(干燥的 CO_2 稀释过的 Cl_2 加热近至 In 熔点)





(CsCl溶于盐酸与水的混和液)

