

明确压强原理,解释压强现象

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化学是一门以实验为基础的学科。要做好化学实验,在明确实验目的后,就要先理解实验原理。实验原理对化学实验起着提纲挈领的作用,是整个化学实验的关键。初中化学实验中有一类和气体压强密切相关。对于这类实验原理的理解,关键是掌握气体压强的原理。初中化学中的压强与物理中的压强有所不同。化学中讨论的压强主要是有关气体物质的压强,很少涉及固体和液体压强,也不像物理中固体和液体压强需要用公式进行定量计算,只要知道气体压强与气体的哪些性质相关、有何种定性关系,并能用此原理熟练解释跟气体压强相关实验的实验现象和成因即可。

下面通过表格详细描述气体压强与哪些因素密切相关。

气体压强	影响因素	关系
	气体的量	气体越多,压强越大;气体越少,压强越小
气体温度	气体温度越高,压强越大;气体温度越低,压强越小	




气体和液体是物质容易流动的状态,所以把这两种状态的物质称为流体。气体和液体的流动是有方向性的,总是从压强大的地方流向压强小的地方。也就是说,在流动的气体和液体两端都存在压强,而这两个压强是不同的,两端的压强差导致气体和液体的流动。

气体或液体的流向:压强大 $\xrightarrow{\text{两端存在的压强差}}$ 压强小

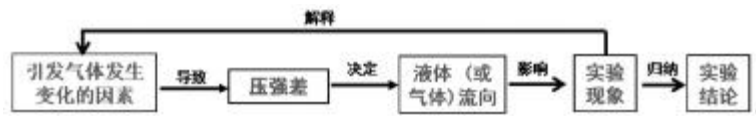
利用此原理可解释两个日常生活中常见现象。

现象	原理
①嘴吹出风	肺中气体进入嘴中,嘴中气体增多,压强增大,大于嘴外的大气压,气体从嘴中喷出形成风
②吸管吸取液体	嘴中气体被吸入肺中,嘴内气体减少,压强减小,小于液体上方的大气压,液体被吸入嘴中

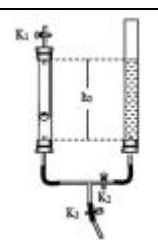
与气体压强相关的实验,在化学课本中比比皆是。下面举例剖析如何用气体压强原理解释实验现象及其成因。

内容	装置	现象	原理
检查装置气密性		导管口有气泡冒出	手握住集气瓶,瓶内气体温度升高,压强增大,大于水面上方大气压,气体从导管口逸出形成水泡
排水集气法		集气瓶中有大量气泡,水从集气瓶中排出	向集气瓶中通入气体,瓶中气体增多,压强增大,大于外界大气压,气体把水排出
用排水法收集氧气,为何要先将导气管拿出水面,再熄灭酒精灯的原理		水被吸入导管	先熄灭酒精灯,试管内气体减少,温度降低,压强减小,小于液面上方大气压,水被吸入导管

通过以上例子可看出,要解释此类实验现象,就要明确知道气体压强的原理。通过对以上气体压强原理的运用,可归纳出以下思路。



【例题】(2017年北京中考)利用下图装置进行实验(两只玻璃管内径相同)。实验前 K_1 、 K_2 、 K_3 均已关闭。

实验装置	【实验1】制备气体	【实验2】测定空气中氧气含量
	左管中带孔的燃烧匙盛有足量锌粒,右管盛有稀硫酸 I. 打开 K_1 和 K_2 ,使反应发生 II. 在 K_1 的导管处收集气体 III.	左管中燃烧匙盛有足量白磷,右管盛有水 I. 光照引燃白磷 II. 待白磷熄灭,冷却,打开 K_2 ,至液面不再变化,右管中液体的高度为 h_1

(1)实验1:锌与稀硫酸反应的化学方程式为_____;为使反应停止,III中的操作是_____。

分析:根据题意,当打开 K_1 和 K_2 ,锌与稀硫酸接触从而反应,化学方程式为: $Zn+H_2SO_4=ZnSO_4+H_2\uparrow$ 。依据题意,为使反应停止,要让锌和稀硫酸分离,使稀硫酸流回右侧的管中,就需要左侧管中的压强增大或温度升高,结合左侧管中已产生气体氢气,只需操作关闭 K_1 就可达到增大左侧管中压强的目的,从而达到实验目的,使反应停止。

通过以上气体压强原理的讲解和思路的归纳,相信考生对气体压强原理的理解和运用有了一定思路和方法。对于气体压强的原理,考生在日常学习中勤加练习,才能运用自如。



英语

初三英语专项指导

重要词汇的应用(三)

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(A)

Last month, our dog welcomed me when I came home from school. He wanted a walk, 1 I was too tired. I threw down my bag and went to the living room. The minute I sat down in front of the TV, my mom came over. "Could you please take the dog for a 2?" she asked.

"Could I watch one show first?" I asked. "No!" she replied angrily. "You watch TV all the time and 3 help out around the house! I can't work all day and do 4 all evening." "Well, I work all day at school, too! I'm just as 5 as you are!" I shouted back.

My mom didn't say anything and walked away. For one week, she did not do any housework and neither did I. Finally, I could not find a 6 dish or a clean shirt.

The next day, my mom came home from work to find the house clean and tidy.

"What happened?" she asked in 7.

"I'm so sorry, Mom. I finally understand that we need to 8 the housework to have a clean and comfortable home." I replied.

答案与解析:

1.but 本题考查转折连词but,通过上下文可知“我们家的小狗想出去溜达,但是我太累了”。

2.walk 根据上文“He wanted a walk.”可知,take the dog for a walk意为“去遛狗”。

3.never 根据上文“You watch TV all the time”可知小主人公总是看电视,从不帮忙做家务。

4.housework 根据句意可知“I can't work all day and do _____ all evening.”意为“妈妈白天上班,晚上要做家务”。

5.tired 根据上文“I was too tired.”和“Well, I work all day at school, too!”可知小主人公认为自己和妈妈一样累。

6.clean 根据上文“For one week, she did not do any housework and neither did I.”和下文“or a clean shirt.”可知一个礼拜没有打扫,屋子里找不到干净的餐具和衣服了。

7.surprise 此句中中介词短语in surprise表示状态,意思是“吃惊地,惊讶地”。

8.share 本题考查对整篇文章主旨的理解——分享家务/家庭成员一起做家务。

(B)

A Country Music Song Changed Her Life Forever

When Sarah was a teenager, she used to fight over almost everything with her family. But five years ago, while she was studying abroad in England, she heard a song full of feelings about returning 1 on the radio. It made Sarah think about her family and friends back in the US. She came to 2 h

ow much she actually missed all of them. Ever since then, she has been a 3 of American country music.

Country is a 4 kind of music from the southern states of America. Nashville, Tennessee is the home of country music. Many songs these days are just about modern life in the US, such as the importance of money and success, but not about belonging to a group. However, country music brings us back to the “good old days” when people were 5 to each other and trusted one another. It 6 us that the best things in life are free — laughter, friends, family, and the beauty of nature and the countryside.

Sarah hasn't been to Nashville yet, but it is her 7 to go there one day. She has already read a lot about the place and done some research on it. She knows that there is a Country Music Hall of Fame Museum in Nashville. There are also always a lot of great country music concerts with 8 musicians and singers, like Garth Brooks. Sarah has already listened to most of his songs. “Garth is one of the most successful musicians in American history. He's sold more than 120 million records. I hope to see him sing live one day!”

答案与解析:

1.home 根据下文“It made Sarah think about her family and friends back in the US.”可知音乐勾起她的思家和思乡情怀。

2.realize 本题考查动词, realize意为“意识到”, come to realize意为“开始意识到”。

3.fan fan在句子中是“粉丝,爱好者”的意思。本句意为从那时开始,她开始成为美国乡村音乐的爱好者。

4.traditional 本题考查形容词, traditional意为“传统的”。从下文“good old days” when people were 5 to each other and trusted one another. It 6 us that the best things in life are free — laughter, friends, family, and the beauty of nature and the countryside.”可知应填表示“著名的”。

5.kind 根据上下文“country music brings us back to the good old days”和“when people trusted one another.”可知音乐描述过去的好时光。kind在句中意为“善良的,好的”。

6.reminds remind意为“提醒,使……想起”。本句是说乡村音乐让我们想起“the best things in life are free — laughter, friends, family, and the beauty of nature and the countryside.”这些最可贵的东西。

7.dream it's one's dream to 某人的梦想是……

8.famous 本题考查形容词, 根据下文“like Garth Brooks. Sarah has already listened to most of his songs.” Garth is one of the most successful musicians in American history. He's sold more than 120 million records.”可知应填表示“著名的”。