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倍数与百分数的正确使用与表达*

林章碧,杨明娇

(四川大学高分子研究所,《油田化学》编辑部,四川 成都 610065)

摘要:在生活与工作中常用到倍数和百分数,然而在汉语与英语的相关表述中却很容易出错。针对这一问题,从倍数、百分数的概念入手,通过具体的实例说明二者的正确使用方法,介绍了常用的倍数增减、百分数、百分点的翻译方法。在表述倍数增加时,需注意"增加几倍"和"增加到几倍"的区别,前者强调净增量,后者强调增加后的结果。在表述倍数减少时,应使用分数。倍数增减的译法均有多种,在翻译时要注意汉语与英语表达思维方式的差异与不同。百分数与百分点既有联系又有区别。百分数是将两个指标进行相对程度对比(相除),而百分点是将两个指标进行绝对程度对比(相减)。用百分数翻译倍数减少时,需注意净减数和减少到某个数量的区别,正确使用介词by和to。

关键词:倍数;百分数;百分点;表达;翻译

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倍数与百分数的用法看似简单,但在实际应用中却容易出错。作者在表示数据增减时常出现以下问题:倍数计算有误、倍数的英文翻译有误、百分数与百分点混淆等。在科技论文中,数据的表述一定要准确规范,切不可疏忽大意。鉴于此,有必要对倍数、百分数、百分点的概念和中英文表达进行深入探讨。

1 倍数的增减

在《现代汉语词典》(第7版)[1]中,对"倍数"的定义为:名词,①一个数能够被另一个数整除,这个数就是另一数的倍数;②一个数除以另一数所得的商。如A÷B=n,即A是B的n倍,n是倍数。汉语中,倍数增加常用的说法为:A是B的n倍、A增加至(增长到)B的n倍,或者A与B相比增加了(增加、大、多)n–1倍。例如,由3增加到6,可以说"增加到2倍"或"增加1倍","增加2倍"则是错误的。

汉语中,表示"少""慢""低"等词后不能用"倍"。因此,"减少5倍""放慢4倍""降低3倍"等表述都不正确,应换算为分数来表示。数量减少误用"倍"是《咬文嚼字》公布的2022年十大语文差错之一[2]。"倍"作量词时用在数词后,某数的几倍就是某数乘以几,如2的3倍是6。量词"倍"一般用于数目的增加,而不用于数目的减少。如果硬要用于数目的减少,减少1倍后数值便成为零,如何"下降10倍"?规范的说法应为:下降到十分之一。

2 倍数的翻译

倍数增加的常用译法为:(1)倍数+as+原级+as,(2)倍数+比较级+than,(3)倍数+名词(size、height、weight、length、width、breadth、level、value、velocity等)+of,(4)表"增加"的动词(increase、rise、grow、

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作者简介:林章碧(1976—),女,副编审,吉林大学分析化学专业博士,研究方向为编辑出版学、数字化出版,E-mail:linzbi@163.com。杨明娇(1977—),女,讲师,本文通讯联系人,四川大学材料学专业博士,通讯地址:610065 四川省成都市四川大学望江校区高分子研究所《油田化学》编辑部,电话:028–85405414,E-mail:ofchemythx@163.com。

speed up、step up、go、multiply 等）+倍数，（5）表“增加”的动词+by（by a factor of）+倍数，（6）使用表示倍数的动词，如 double、treble/triple、quadruple、quintuple 等。翻译时需注意净增加数（增加了 n 倍，不含基数）和增加后的总数（增加到 n 倍，含基数）的区别。在翻译中尽量避免使用“倍数+比较级+than”的译法，易引起歧义。

例如：与聚丙烯酰胺凝胶相比，X 水凝胶的黏附力提高了 2 倍，即 X 水凝胶的黏附力是聚丙烯酰胺凝胶的 3 倍。可翻译为：

The adhesion force of X hydrogel was three times as high as that of polyacrylamide gel.

The adhesion force of hydrogel was three times the magnitude of that of polyacrylamide gel.

The adhesion force of hydrogel increased by three times compared to polyacrylamide gel.

The adhesion force of hydrogel tripled compared to polyacrylamide gel.

倍数减少的常用译法为：（1）倍数+as+原级（light、small、slow、short、thin 等）+as，（2）倍数+比较级+than，（3）表“减少”的动词（decrease、shorten、reduce、fall、drop、weaken、step down、speed down、go down 等）+倍数，（4）表“减少”的动词+by（by a factor of）+倍数。翻译时需注意汉英语法习惯的不同。例如：

调驱后的成本减少了三分之二。The cost after profile control decreased three times.（减少到三分之一）

3　百分数与百分点

百分数与百分点，一字之差却有千里之别。百分数是分母为 100 的分数，通常用百分号（%）来表示。百分点在统计学上指以百分数形式表示的不同时期相对指标的变动幅度[3]，即两个百分数的差值比较。油气行业常用百分数来表示采收率，但在描述采收率增量时常常混淆了百分数与百分点。例如，驱油剂的采收率为 50.36%，相比于水驱（36.18%）提高了 14.18%。采收率从 36.18%增至 50.36%，应为提高了 14.18 百分点。若用百分数表示，则应为（50.36%−36.18%）/36.18% × 100% = 39.19%，提高了 39.19%。相比之下，百分点计算简便、更加直观。又如 CO_2-水与岩石反应后，MgO 浓度从 1.38%增加到 3.98%，增长了 2.6%。其中有 2 处错误：（1）“浓度”一词作为简称时，只能指物质的量浓度，法定单位为 mol/L 或 mol/m^3。质量分数或体积分数（用%表示）不能简称为“浓度”[4]，因此“MgO 浓度”应改为 MgO 质量分数。另外，国家标准 GB 3101—93《有关量、单位和符号的一般原则》指出：由于百分是纯数字，质量百分、体积百分和百分浓度的说法在原则上是无意义的，应避免使用；也不能在单位符号上加其他信息，如%（*m*/*m*）、%（*W*/*W*）或%（*V*/*V*）。质量分数用 *w* 表示，体积分数用 *φ* 表示。比如 Ca 的质量分数为 25%，规范表示应为 *w*（Ca）=25%。（2）MgO 质量分数从 1.38%增加到 3.98%。3.98%−1.38%=2.6%，应表达为增长了 2.6 百分点。若用百分数表示，则应为（3.98%−1.38%）/1.38%×100%=188%，增长了 188%。百分数和百分点既有联系又有区别，使用时不能直接替换。需要指出的是，用百分数表示数值的范围时，前一个数字的百分号不能省略，如 15%～20%，不能写成 15～20%。

4　百分数与百分点的翻译

20%可译为 20 percent 或直接用 20%表示，百分点可译为 percentage point。在翻译倍数减少时，亦可用百分数表示。需要注意的是，表“减少”的动词+（by）百分数表示纯减数、“减少了”，而表“减少”的动词+to+百分数则表示“减少到”。例如：

调驱后的含水率下降了 10%。The water cut decreased by 10% after profile control.

去年采油厂的成本下降到 2022 年的 75%。The cost of oil production plant last year fell to 75% of that in 2022.

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Correct Usage and Expression of Multiple and Percentage

LIN Zhangbi, YANG Mingjiao
(*Polymer Research Institute, Editorial Office of Oilfield Chemistry, Sichuan University, Chengdu, Sichuan 610065, P R of China*)

Abstract: Multiple and percentage are often used in daily life and work. However, wrong usages of multiple and percentage are often found in papers written in Chinese or English. To solve this problem, this paper started with the concepts of multiple and percentage, illustrated the correct usage of them through examples, and then introduced the common translation methods of multiple increase and decrease, percentage and percentage point. When expressing an increase in multiple, attention should be paid to the difference between "increase by several times" and "increase to several times". The former emphasized the net increase, while the latter emphasized the result after increase. When expressing a reduction in multiple, fraction should be applied. There were many ways to translate multiple increase and decrease. Attention should be paid to the differences between Chinese and English ways of thinking in translation. Percentage and percentage point were both related and different. Percentage was to compare the relative degree of two indicators (division), while percentage point was to compare the absolute degree of two indicators (subtraction). When translating multiple decrease by percentage, it was necessary to notice the difference between net reduction and reduction to a certain amount, meanwhile, correctly use the prepositions, such as by and to.
Keywords: *multiple*; *percentage*; *percentage point*; *expression*; *translation*

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Research Progress on Asphaltene Deposition Mechanism and Theory in Reservoir Development

GUO Yongwei[1,2], ZHANG Guowei[3,4], JIN Ping[1]
(*1. Department of Petroleum Engineering, Hebei Petroleum University of Technology, Chengde, Hebei 067000, P R of China; 2. Chengde Oil and Gas Field Artificial Intelligence Engineering Technology Research Center, Chengde, Hebei 067000, P R of China; 3. Hubei Key Laboratory of Oil and Gas Drilling and Production Engineering (Yangtze University), Wuhan, Hubei 430100, P R of China; 4. School of Petroleum Engineering, Yangtze University, Wuhan, Hubei 430100, P R of China*)

Abstract: Asphaltene, as the most complex solid component in crude oil, is highly susceptible to various factors due to its diverse molecular structure and weight, leading to instability and deposition. In order to establish operational guidelines for avoiding asphaltene deposition in oil reservoir exploitation, a review and summary of research on asphaltene deposition experiments and simulations both domestically and internationally were conducted. Starting from the deposition stage of asphaltene, the deposition process could be divided into three stages: precipitation, flocculation and deposition. Then a brief overview of stability evaluation methods was provided. The factors affecting the deposition of asphaltene were discussed in detail from the aspects of fluid properties (including types of precipitants, crude oil components and viscosity), reservoir properties, and production processes (including temperature, pressure, flow rate and development method). The results showed that the critical conditions for asphaltene deposition could be accurately obtained using optical microscopy and light scattering method. And then combined with thermodynamic models of asphaltene deposition (including solubility and colloid models), effective predictions could be made for asphaltene deposition during the development process. Among them, the PC-SAFT equation of state for statistical association fluid theory considered the polarity and correlation of asphaltene particles, which could relatively accurately simulate the phase behavior of asphaltene. In response to the problems in indoor experiments and numerical simulations of asphaltene deposition, the possible directions for future research on asphaltene deposition were mainly to accurately determine the molecular weight and structure of asphaltene, establish a universal asphaltene phase equilibrium equation, and clarify the mechanism and model of asphaltene deposition in reservoir rocks. This research achievement provided reference and guidance for in-depth analysis of the deposition mechanism of asphaltene, improvement of asphaltene deposition theory, and overcoming difficult and complex problems.
Keywords: *asphaltene*; *sedimentation mechanism*; *thermodynamic model*; *phase behavior characteristic*; *review*