**ANSWERS:** pH calculations

UNITS must be shown in your answer

Answers should be to 3 sig fig

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Year** | **Solution** | **[H3O+]**  mol L–1 | **[OH-]**  mol L–1 | **pH** |
| 2017 | NaOH(aq) | 2.51 × 10–12 | 3.98 x 10-3 | 11.6 |
|  | 2.96 × 10–4 mol L–1 of KOH(aq) | 3.38 x 10-11 | 2.96 x 10-4 | 10.5 |
| 2016 | 0.0341 mol L–1 HCl (aq) | 0.0341 | 2.94 x 10-15 | 1.47 |
|  | NaOH (aq) | 3.98 × 10–13 | 0.0251 | 12.4 |
| 2015 | 0.0243 mol L–1 HNO3 (aq) | 0.0243 | 4.12 x 10-13 | 1.61 |
|  | KOH (aq) | 1.58 x 10-12 | 6.31 x 10-3 | 11.8 |
| 2014 | potassium hydroxide, KOH | 1.58 × 10–13 | 0.0633 mol L–1 | 12.8 |
|  | 2.25 × 10–4 mol L–1 NaOH | 4.44 x 10-11 | 2.25 × 10–4 | 10.4 |
| 2013 | 0.0125 mol L–1 HNO3 | 0.0125 | 8 x 10-13 | 1.90 |
| 2012 | 9.56 × 10–5 mol L–1 of OH- | 1.05 × 10–10 | 9.56 × 10–5 | 9.98 |
|  | 0.133 mol L–1 solution of HCl | 0.133 | 7.52 x 10 -14 | 0.876 |
|  | a solution of NaOH with a pH of 12.8. | 1.58 × 10–13 | 0.0631 | 12.8 |
| 2011 | 0.0498 mol L–1 hydrochloric acid | 0.0498 | 2.01 x 10-13 | 1.3 |
|  | 0.251 mol L–1 sodium hydroxide | 3.98 x 10-14 | 0.251 | 13.4 |
|  | a sample of polluted rainwater has a pH of 4.62 | 2.40 x 10–5 | 4.17x1010 | 4.62 |
| 2010 | 0.108 mol L–1 hydrochloric acid | 0.108 mol L–1 | 9.26 × 10–14 mol L–1 | 1.93 |
|  | hydrochloric acid with a pH of 1.58 | 0.0263 mol L–1 | 3.80 × 10–13 mol L–1 | 1.58 |
|  | 0.362 mol L–1 sodium hydroxide. | 2.76 × 10–14 mol L–1 | 0.362 mol L–1 | 13.6 |
| 2009 | 0.0376 mol L–1 HCl solution | 0.0376 | 2.66 × 10–13 | 1.42 |
|  | 2.48 × 10–4 mol L–1 NaOH solution | 4.03 × 10–11 | 2.48 × 10–4 | 10.4 |
| 2008 | 0.00112 mol L–1 HCl solution. | 0.00112 | 8.93 × 10–12 | 2.95 |
|  | 3.68 × 10–2 mol L–1 NaOH solution | 2.72 × 10–13 | 3.68 × 10–2 | 12.6 |
| 2007 | 0.125 mol L–1 HCl. | 0.125 | 7.99 x 10-14 | 0.903 |
|  | NaOH solution at pH 10.2 | 6.33 x 10-11 | 1.58 × 10–4 mol L–1 | 10.2 |
|  | 0.124 mol L–1 NaOH. | 7.9 x 10-14 | 0.127 | 13.1 |

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