**NAMA : ..........................................................**

**KELAS : ..........................................................**

1. **Soal Objektif**

**Berilah tanda silang (x) pada salah satu option jawaban yang dianggap benar dan berikan alasan pemilihan jawaban pada tempat yang telah disediakan.**

1. Berikut ini adalah ciri-ciri terjadinya reaksi kesetimbangan, kecuali… .

a. Reaksi reversibel

b. Terjadi dalam ruang tertutup

c. Laju reaksi ke arah produk sama dengan laju reaksi ke arah reaktan

d. Reaksinya tidak dapat balik

e. Tidak terjadi perubahan makroskopis

Alasan :

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1. Contoh kesetimbangan heterogen dari reaksi- reaksi berikut yaitu.......
2. 2 SO2 (g)+ O2(g) 2 SO3(g)
3. 2 NH3(g)  N2(g)+ 3 H2(g)
4. PCl5(g) PCl3(g)+ Cl2 (g)
5. H2 (g) + I2(g)  2 HI (g)
6. CaCO3 (S) CaO (S) + O2 (g)

Alasan :

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1. Reaksi penting pada pembuatan asam sulfat menurut proses kontak ialah

2SO2(g) + O2(g)⇌ 2SO3(g)∆H = –188,2 kJ Agar diperoleh hasil optimum, maka faktor yang dapat diubah adalah ….

a. menambah katalis dan menurunkan suhu

b. menaikkan suhu dan tekanan reaksi

c. menurunkan tekanan dan menambah suhu

d. menaikkan tekanan dan menurunkan suhu

e. memperbesar volum dan menambah

Alasan :

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1. Di antara faktor- faktor di bawah ini yang menggeser kesetimbangan:

PCl3 (g) + Cl2 (g)  PCl5 (g)  ΔH = + x kJ/mol

ke arah reaktan (kiri) adalah....

1. Menurunkan suhu kesetimbangan
2. Memperbesar tekanan pada sistem
3. Memperkecil volume sistem
4. Menambah konsentrasi PCl3 (g)
5. Menambah konsentrasi Cl2 (g)

Alasan :

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1. Reaksi pembuatan belerang trioksida menurut proses kontak :

2 SO2 (g) + O2 (g) 2 SO3 (g)  ΔH = - 45 kJ

 Faktor yang membantu peningkatan produksi gas SO3 adalah....

1. Memperkecil volume
2. Mengurangi oksigen
3. Mengurangi gas SO2
4. Memperkecil tekanan
5. Meningkatkan suhu

Alasan :

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1. Pada pembuatan amonia: N2(g)+ 3 H2(g) 2 NH3(g) ΔH = –x kJ, penambahan konsentrasi nitrogen mengakibatkan....
2. Kesetimbangan bergeser ke arah kiri/reaktan
3. Kesetimbangan bergeser ke kanan/produk
4. Kesetimbangan bergeser ke endoterm
5. Tidak bergeser
6. Hasil NH3 berkurang

 Alasan :

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1. Harga tetapan kesetimbangan (Kc) untuk reaksi :

Fe2O3(s) + 3 CO (g) 2 Fe (s) + 3 CO2 (g) adalah …

1. Kc = $\frac{\left[Fe\right][CO\_{2}]}{\left[CO\right][Fe\_{2}O\_{3}]}$
2. Kc = $\frac{[CO\_{2}]^{3}}{\left[CO\right]^{3}}$
3. Kc = $\frac{[Fe]^{2}[CO\_{2}]^{3}}{[Fe\_{2}O\_{3}][CO]^{3}}$

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1. Kc = $\frac{[CO\_{2}]}{[CO]}$
2. Kc = $\frac{[Fe]^{2}}{[Fe\_{2}O\_{3}]}$

Alasan :

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1. Data percobaan reaksi kesetimbangan 2 SO2 (g) + O2 (g) 2 SO3 (g) sebagai berikut :

|  |  |  |
| --- | --- | --- |
| **Zat** | **Volume** | **Konsentrasi pada kesetimbangan** |
| SO2 | 1 L | 0, 4 |
| O2 | 1 L | 0, 7 |
| SO3 | 1 L | 0, 6 |

 Besarnya tetapan kesetimbangan (Kc) pada 25˚C (mol/L) adalah....

1. Kc = $\frac{(0,4)^{2}}{\left(0,7\right)(0,6)^{2}}$
2. Kc = $\frac{(0,6)^{2}}{\left(0,7\right)(0,4)^{2}}$
3. Kc = $\frac{\left(0,6\right)}{\left(0,4\right)\left(0,7\right)}$
4. Kc = $\frac{(0,7)^{2}}{\left(0,4\right)(0,6)^{2}}$
5. Kc = $\frac{(0,7)^{2}}{\left(0,6\right)(0,4)}$

Alasan :

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1. Reaksi kesetimbangan:

 C (s) + O2(g) CO2(g).

Rumus tetapan kesetimbangan parsial gas reaksi di atas adalah....

1. Kp = ($P\_{C}$) (P$o\_{2})$

1. Kp = $\frac{(P\_{O\_{2}})}{(P\_{CO\_{2}})}$

1. Kp = $\frac{(P\_{CO\_{2}})}{(P\_{O\_{2}})}$
2. Kp = $\frac{(P\_{C })(P\_{O\_{2}}) }{\left(P\_{CO\_{2}}\right)}$
3. $Kp= \frac{(P\_{CO\_{2}})}{\left(P\_{C}\right)(P\_{O\_{2}})}$

Alasan :

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1. Harga konstanta kesetimbangan parsial gas untuk reaksi berikut adalah ...

 2 N2O5(g) 4 NO2(g)+ O2(g)

1. Kp = ($P\_{N\_{2}O\_{5}}$)2
2. Kp = ($P\_{NO\_{2}}$)4 ($P\_{O\_{2}}$)
3. Kp = $\frac{(P\_{NO\_{2}})^{4}}{(P\_{N\_{2}O\_{5}})^{2}}$
4. Kp = $\frac{(P\_{N\_{2}O\_{5}})^{2}}{(P\_{NO\_{2}})^{4}(P\_{O\_{2}})}$
5. Kp = $\frac{(P\_{NO\_{2}})^{4}(P\_{O\_{2}})}{(P\_{N\_{2}O\_{5}})^{2}}$

Alasan :

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1. **Soal Uraian**

**Jawablah soal- soal berikut pada lembar jawaban yang telah disediakan.**

1. Dalam bejana 10 L dimasukkan 5 mol HI (g) yang terurai menurut reaksi :

2 HI (g)  H2 (g) + I2 (g)

Jika dalam keadaan setimbang masih ada 2 mol gas HI, tentukan nilai konstanta kesetimbangan (Kc)!

1. Diketahui reaksi kesetimbangan:

2 CO(g)+ O2(g) 2 CO2(g)

Dalam ruang 2 liter direaksikan 6 mol CO dan 6 mol O2. Jika pada saat setimbang terdapat 4 mol gas CO2, hitunglah harga Kc!

1. Pada suhu tertentu gas NO dan gas O2 masing-masing sebanyak 6 mol dicampurkan dan bereaksi membentuk 4 mol gas NO2 menurut reaksi:

2 NO(g)+ O2(g) 2 NO2(g)

Jika tekanan total = 2 atm, hitunglah harga Kp!

1. Pada suhu tertentu terjadi kesetimbangan:

2 SO2 (g) + O2(g) 2 SO3(g)

Pada keadaan kesetimbangan terdapat tekanan parsial gas O2 = 0,2 atm dan SO3 = 0,8 atm. Jika harga Kp= 8, tentukan tekanan parsial gas SO2 !

1. Dalam suatu bejana yang bervolume 1 L, 4 mol gas NO2 membentuk kesetimbangan berikut :

2 NO2 (g)  2 NO (g) + O2 (g)

Dalam keadaan setimbang pada suhu tetap, terbentuk 1 mol O2 (g). Hitunglah derajat disosiasi gas NO2 !