

## ATP-PC ENERGY SYSTEM

Explain the principles of a coupled reaction using the ATP-PC energy system as your example.

(5)

1.	Principle of Coupled reaction	<b>linked</b> reactions take place/the products of one reaction are used/linked in/to another/second reaction
2.	exothermic reaction	the first reaction (a compound is broken down) produces energy/exothermic reaction
3.	eg	PC broken down to release energy/ $PC \rightarrow P+C+ENERGY$
4.	endothermic reaction	in the second reaction the energy created in the first is used to form a compound/endothermic reaction
5.	eg	Energy from breakdown of PC used to resynthesise ATP $Energy + ADP + P_i = ATP$

Use examples to describe how players resynthesise ATP during a game using the ATP-PC system.

(4)

<b>Alactic/ATP/ PC (must be named)</b>	<b>e.g from a team sport</b> , Sprinting to get to a ball/ to defend/ make a tackle/ powerful shot on goal/ jump/block/spike (or equiv)
1. (intensity/duration)	Aspects / examples of the game that are high intensity and short duration / <10 seconds
2. (fuel)	(Fuel is) PC/ phosphocreatine
3. (energy yield)	(Generate) 1 (mole) of ATP (per PC) / 1:1 ATP:PC
4. (process)	Breakdown PC to creatine and phosphate with energy released (used to resynthesise ATP)
5.(enzyme)	using the enzyme creatine kinase
6.(Coupled reaction)	coupled reaction or $PC \rightarrow P + C + energy$ <b>and</b> $energy + P + ADP \rightarrow ATP$
7. (location)	(Takes place in the muscle) sarcoplasm
<b>Lactic acid (must be named)</b>	<b>e.g from a team sport</b> Counter attack/ turnover/attack at goal (or equiv)
8. (intensity/ duration)	High intensity aspects of a longer duration/up to 3 minutes
9. (fuel)	(Fuel is) glycogen/glucose or carbohydrate
10. (energy yield)	(Energy yield is) 2 (moles) ATP (per glycogen/glucose) or 1:2 glycogen/glucose:ATP
11. (process)	Glycogenolysis or glycogen to glucose
12.(enzyme action)	glycogen phosphorylase/GPP/GP converts glycogen to glucose
13. (process)	(Anaerobic) glycolysis
14.(enzyme action)	PFK converts glucose to pyruvic acid or (then) LDH converts pyruvic acid to lactic acid
15. (location)	(Takes place in the muscle) sarcoplasm