

CREATINE HCl vs CREATINE MONOHYDRATE

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Creatine is one of the most well-researched supplements in existence. With decades of studies backing its efficacy, creatine has become a staple in the supplement arsenal of those striving to become the strongest and fittest versions of themselves.

It has been used for decades by athletes to improve performance, help build muscle, and increase strength.

The original, most well-researched form of creatine is creatine monohydrate. However, it's not the only form. The landscape of creatine has evolved, giving rise to various forms, each with unique characteristics and benefits. A prominent form is creatine hydrochloride, or creatine HCl.

So, what sets these two forms apart? Does it matter which one you take? In this comprehensive guide, we will delve into the science, benefits, and key differences between Creatine Monohydrate and Creatine HCL. We'll break down the facts, dispel the myths, and empower you to choose the right creatine for your journey.

	Creatine Monohydrate	Creatine HCl
Solubility	X	XXX
Can Increase Phosphocreatine Levels	XXX	XXX

What Is Creatine?

Creatine is a naturally occurring compound found in the human body, primarily in the muscles. It's composed of three amino acids: arginine, glycine, and methionine. It plays a crucial role in the production of energy during high-intensity, short-duration activities like resistance training and sprinting.

It helps regenerate a molecule called adenosine triphosphate (ATP), which is the primary energy currency of the cell. When you exert yourself in a quick burst of activity, ATP gets used up, and creatine helps replenish it, supporting peak performance.

How to Increase Creatine Levels

The body does synthesize creatine, mainly within the liver and kidneys. We produce around 1g of creatine per day (Persky et al. 2001), which is below what has been researched as the optimal amount for athletic performance.

It can also be obtained externally through diet. Red meat and fish, for example, are high in creatine. However, the amount of creatine from dietary sources may not be optimal for athletes or those engaged in intense physical training, making supplementation a popular choice.

The Benefits of Creatine

Because of its role to encourage regeneration of ATP, creatine helps us recover faster in between sets. This in turn can lead to increases in strength, power, and lean muscle mass. Here are just a few benefits creatine has been shown to provide (Buford et al., 2007):

- Increased strength and power*
- Increased muscle mass*
- Improved between set recovery*
- Improved sports performance*

Creatine Monohydrate



Creatine Monohydrate is the most well-known and extensively studied form of creatine. It has been the subject of hundreds of scientific studies and is often considered the gold standard of creatine supplements.

Composition and Molecular Structure

Creatine Monohydrate consists of one creatine molecule combined with one water molecule.

Creatine HCl



Creatine Hydrochloride, or Creatine HCl, is a newer form of creatine with some unique properties that have made it more and more popular. Thanks to its structure, it may offer some distinct advantages.

Composition and Molecular Structure

Creatine HCl is formed by attaching a hydrochloride (HCl) group to the creatine molecule. This chemical change leads to **one key difference: higher solubility.**

So What's Better, Creatine Monohydrate or Creatine HCl?

The truth is, it depends. It depends on your goals, how you take creatine HCl, and whether you're concerned about factors like water retention. We believe both have their place. With that said, here are the key differences so you can make the best choice for you.

Difference #1 Between Creatine Monohydrate and Creatine HCl: Mixability

Solubility or in this case, 'aqueous solubility' (solubility in water), describes how well creatine mixes and is absorbed.

Below is a list of the common creatine forms and their relative solubility score (the higher the score, the greater the solubility).

As you will see, creatine HCl has **by far the best solubility.**

- Creatine Monohydrate: 1.0
- Creatine Citrate: 3.0
- **Creatine HCl: 37.9**
- **High solubility = easy mixing**

Here are the effects this can have.

Creatine HCl is less likely to clump

Because it mixes easier, it's less likely to clump at the bottom of your shaker bottle.

Creatine HCl may be easier to stack

Because it mixes easily, creatine HCl can easily be added to pre-workout products and other supplement stacks.

Why This May Not Matter

If you take creatine in capsules, then this is less of a factor. It also matters less if you're mixing your creatine into a post-workout shake, especially if you use a blender. Using more water also helps creatine monohydrate mix, so if you use creatine monohydrate, be sure to follow the directions.

Micronized Creatine Monohydrate Can Help This

This means it contains small particles, which help it mix more easily in water. It still won't mix as easily as Creatine HCl, but it can make this less of a factor.

Difference #2 Between Creatine Monohydrate and Creatine HCl: Water Retention

Creatine and water have a well-known relationship.

Many sources of creatine, including typical creatine monohydrate, may require a large amount of water to mix into a beverage form.

This is often why some people experience digestive issues and extracellular (outside the cell) water retention with creatine.

While creatine supplementation comes with a necessity to focus on hydration, many athletes like Creatine HCl because they can take the same amount of creatine with less water than would be required to make monohydrate easily mixable.

This also may make creatine HCl the better choice if you're looking to avoid the puffy, water-retained "bloating" look.

For this added benefit, many bodybuilders and physique competitors turn to creatine HCl.

Creatine Monohydrate and Creatine HCl Difference #3: GI Distress

This is also related to the solubility. For those struggling with GI discomfort/distress on their regular creatine supplement, like creatine monohydrate, switching to Creatine HCl which you can easily mix with less water, could help.

However, many people report no problems or GI discomfort with creatine monohydrate.

If you've tried creatine monohydrate and experienced side effects like stomach discomfort, consider trying creatine HCl. If not, then creatine monohydrate could be the choice for you.

Creatine Monohydrate vs Creatine HCl Difference #4: Research

The next key difference is that creatine monohydrate has much more research behind it. Studies that have looked at whether creatine HCl is more effective have shown no additional benefits for key markers like muscle mass and strength.

Creatine monohydrate shows the strongest research for supporting strength and helping build muscle.

Choosing The Right Creatine For Your Goals

With this article, we've aimed to give you a nuanced understanding of the differences between the two forms, rather than declaring one as a hero and the other as a villain.

Creatine HCl vs Monohydrate Frequently Asked Questions

Do I Need To Use a Loading Phase For Creatine Monohydrate or Creatine HCl?

Creatine loading is a debated topic within the bodybuilding community. The answer to whether or not you should load creatine may depend on the source and an individual's goal.

Both sources of creatine do not need to be loaded and it provides no additional benefit in the long-term (Willoughby et al., 2006). However, loading may help you saturate the cells a few weeks faster.

This goes for both creatine monohydrate and creatine HCl. If you want to load creatine at the start, you can.

The research shows that without loading creatine it takes at least 28 days to accumulate in the body before providing benefits.

In simple terms, **creatine loading is the fast-track, but it's not necessary.**

There's no evidence that you should approach the loading phase any differently with either form.

What Is The Benefit to a Loading Phase?

Creatine supplementation only shows benefits after the muscle cells begin to saturate with creatine. The logic of the loading phase is to give your body a super dose of creatine for your first week of supplementing in order to more quickly saturate your muscles.

Isn't Hydrochloric Acid Harmful?

If you were an astute chemistry student, you may remember HCl as a highly acidic, potentially dangerous compound. Creatine is a weak base, and hydrochloric acid is a strong acid. When the two combine together, they neutralize one another, creating the stable creatine hydrochloride.

Can I Take Smaller Doses of Creatine HCl And Get The Same Benefit?

Since creatine HCl is more soluble, this has led to claims about higher absorption, and therefore needing a lower dose to get the same effect.

However, this has not been backed up by the research. To saturate your muscle cells with creatine, you will still want to take the recommended dose on the label.

For the best results, you should take the same amount of creatine HCl as you would creatine monohydrate.

Do I Need to Cycle Either Form of Creatine?

Another popular strategy to cycle your creatine intake; however, no research has shown this to be superior to a consistent, daily dose (Willoughby et al., 2001).

Without evidence of health risk or performance improvements from cycling, you may just be wasting periods of time when your creatine stores become depleted.

Countless users have taken creatine daily for years without cycling it and have seen no adverse effects. In fact, they simply continue to gain from the benefits of creatine.

This goes for creatine monohydrate, creatine HCl, and other forms of creatine.

What Are Common Side Effects of Creatine?

Since creatine causes your body to retain water, when you start taking creatine you may experience slight weight gain. This is not fat or muscle, but water. It's nothing to worry about as long as you stay hydrated.

The other commonly reported side effect of creatine is stomach discomfort and GI distress. If you experience this with creatine monohydrate, consider trying creatine HCl.

****These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.***

References

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